# The Effects of Social and Institutional Structures on Decision-Making and Benefit Distribution of Community Forestry in Nepal

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Bhagwan Dutta Yadav

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Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Forest Economics

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Participatory democracy has been an official part of Community Forestry (CF) since 1989 when the main policy document, the Master Plan for the Forestry Sector (MPFS), was introduced in Nepal. However, many problems related to benefit distribution from CF have emerged because of the way decision-making is influenced by the social and institutional structures present at the community level, particularly in terms of dominance by wealthy and caste elite and the inability of poor and disadvantaged households to participate fully in decisions. The purpose of the study is to investigate the potential for poor and disadvantaged households to have positions on the Executive Committee (EC) of the Community Forestry User Group (CFUG), and whether representation of the poor and disadvantaged on the EC has any influence on the distribution of CF products or the formulation of distribution rules.

The study used a conceptual approach using elite theory with models that looked at EC decisions based on whether there was a single caste in the CFUG or multiple castes, and whether only rich households were on the EC or whether a mix of rich and poor households were on the EC. Rich and/or high caste individuals, typically identified with EC membership, would interact on the EC either as a consensually integrated elite where there was one caste, or a plural elite where there was a mix of castes. A mix of rich and poor households on the EC was characterised as an organisational elite model, in which the EC organisation provided power and influence to members of the EC, including the poor, thus providing a balance to the dominance by the traditional elite.

The study uses CFUG-level data from 31 CFUGs in the *Baglung* district and household data from 310 households. The results of the study show that while the usual factors associated with wealth and caste are important for selection to EC leadership positions, NGO membership was also an important factor EC leadership positions. The importance of NGO membership is that it means that NGOs and civil organisations are able to strengthen the leadership capabilities of poorer and disadvantaged people or encourage/empower someone to

be an EC member through training, workshops and study tours. This finding also supports the concept of the organisational elite model. The study also examined the effect of representation of the poor and disadvantaged on the EC by studying the factors that determined the relative distribution of forest products and the rules of distribution. In both cases, the higher the representation of the poor and disadvantage on the EC, the greater the benefits to the poor, both in terms of greater quantities distributed and longer distribution or collection periods.

The policy implication of the study is that there is a way to overcome the traditional domination of the EC by the local elite through greater activity of NGOs, CBOs and civil society organisations. These organisations help the poor and underprivileged households to build up capacity to undertake leadership roles and through the organisational elite model become part of the elite decision-making.

*Keywords: Community forest, Community Forest User Group, Leadership, organisational elites, consensually integrated elites, plural elites, proportion of EC, influences, timber, firewood, fodder, leaf litter.*

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I dedicate this work to my late father, **Sukhadev Yadav** and mother, **Sajo Devi Yadav**, who started my academic expedition to this level.

# Acronyms

| | |
|---|---|
| AD | The *Anno Domini* dating system was devised in 525 by Dionysius Exiguus, who used it to compute the date of the Christian Easter Festival, |
| AMSL | Above Mean Sea Level |
| CBDD | Community Based Driven Development |
| CBNRM | Community Based Natural Resource Management |
| CBO | Community Based Organisation |
| CDM | Clean Development Mechanism |
| CF | Community Forestry |
| CFMP | Collaborative Forest Management Plan |
| CFUGs | Community Forestry User Groups |
| CHHE | Caste Hill Hindu Elite |
| CTVET | Centre for Vocational and Educational Training |
| DANIDA | Danish International Development Agency |
| DLGDP | Decentralised Local Government Development Programme |
| DDC | District Development Committee |
| DFO | District Forest Office/District Forest Officer |
| DNGOF | Dalit NGO Federation |
| DoF | Department of Forest |
| EC | Executive Committee |
| FAO | Food and Agriculture Organisation |
| FECOFUN | Federation of Community Forestry User Group in Nepal |
| GDP | Gross Domestic Product |
| ha | Hectare |
| I/NOG | International/Non-Governmental Organisation |
| IHDP | Integrated Hill Development Programme |
| K-BIRD | Karnali-Bheri Integrated Rural Development |
| KHARDEP | Koshi Hill Area Rural Development Programme |
| KHDP | Koshi Hill Development Programme |
| LFP | Livelihood and Forestry Programme |
| LRMP | Land Resource Mapping Project |
| m | Metre |
| MDGs | Millennium Development Goals |
| mm | Millimetre |

| | |
|---|---|
| MPFS | Master Plan For Forestry Sector |
| NAFP | Nepal Australia Forestry Project |
| NATO | North Atlantic Treaty Organisation |
| NFI | National Forestry Inventory |
| NRM | Natural Resource Management |
| NSCFP | Nepal Swish Community Forestry Project |
| NTFPs | Non Timber Forest Products |
| NUCFP | Nepal-UK Community Forestry Programme |
| OFMP | Operational Forest Management Plan |
| OLS | Ordinary Least Squares |
| OP | Operation Plan |
| PASRAP | Poverty Alleviation in Selected Rural Areas of Nepal |
| PF | Panchayat Forest |
| PPF | Panchayat Protected Forest |
| PRMCIP-MS | Nepal Marginalised Community Empowerment Project |
| PVSE | Poor, Vulnerable and Socially Excluded |
| REDD | Reduced Emissions from Deforestation and Forest Degradation |
| RIRDP | Rapti Integrated Rural Development Programme |
| RNRDIP | Rasua-Nuwakot Interpreted Rural Development Programme |
| RWUDUC | Rural Women Development Centre |
| RWSS | Rural Water Supply and Sanitation |
| S/MIRD | Seti and Mahakali Integrated Rural Development |
| SAGUN | Strengthened Actions for Governance in Utilization of Natural resources |
| SIRDP | Sagarmatha Integrated Rural Development Programme |
| TDN | Total Digestible Nutrient |
| UK | United Kingdom |
| UK-DFID | United Kingdom Department for International Development |
| UNICEF | United Nation Children's Fund |
| USA | United Stated America |
| VDC | Village Development Committee |

# Glossary

| | |
|---|---|
| Bahun (Brahmin), Chhetry, Thakuri and Newar | Elite castes used for this research |
| Bari | Cultivated land in hills and mountains occurs mostly on slopes between 15 and 25 degrees |
| Bhari | Head load, on average 40 kg |
| Birta, Math | Forest Land particularly in Terai provided by King and Rana rulers to their relatives and closest persons |
| Brahmins or Bahun | Primarily priests and one of the elite castes |
| Butyan | Land in hills and mountains occurs mostly on slopes between 20 and 35 degrees |
| Char kose jhadi | Dense forests approximately 12 kilometres wide |
| Dalit | Lower untouchable caste |
| Dharmasastras | The civil and criminal law of the nation |
| Jagir | Service provided by King and Rana rulers to their nearest persons and relatives particularly in military |
| Janjati | Middle caste |
| Khet | Rice land, a cultivated land type. |
| Kshataryias | Warriors |
| Madhesi | Populace who live in Terai (Plain area) |
| Mulki ain | National legal code |
| Pahadia | Populace who live in hills |
| Panchyat | Partiless political system |
| Raj | State |
| Ropani | Unit of land area: 20 Ropani =1 hectare |
| Shudras | Lower Caste artisans and manual labourers |
| Tagadhari | Wearier of the sacred thread |
| Terai | Plain area particularly in tropical region in Nepal |
| Vaishias | Businessman |
| Varna | Group of people |

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# Chapter 1
# INTRODUCTION

## 1.1 Background the Research

Community forestry (CF) in Nepal emerged with the Forest Act 1978 and is based on the participatory approach principle. CF was established by the Master Plan for the Forestry Sector (MPFS) 1989. It is governed by the Forest Act 1993 and the Forest Regulations 1995. It is an example of Community Based Natural Resource Management (CBNRM). It could be a model of community driven development for the successful implementation of administrative processes, such as constitutions, operational plans and Community Forest User Group (CFUG) Executive Committee (EC) structures and for the conservation of natural regeneration of forests (Iversen, et al., 2006). Recent literature suggests that local leadership in decision-making has, indeed, become increasingly inclusive of the needs and interests of pro-poor (Baland, Bardhan, Das, & Mookherjee, 2010; Dhakal, Bigsby, & Cullen, 2007; Fisher, 2007; Springate-Baginski, Blaikie, Dev, Yadav, & Soussan, 2000; Vermeulen, Nawir, & Mayers, 2008). However, Jones (2007) found that there may be trade-offs between rich and poor households in terms of decision-making, benefit distribution and that the poor appear to be further marginalized as a result of community forestry.

Most nations agree that it would be impossible for the world to reach the Millennium Development Goals on poverty and environmental protection without addressing access over resources for the 1.6 billion people, nearly one third of the planet's population, who depend on forests for their survival (Dach, Ott, Klaey, & Stillhardt, 2006; United Nation, 2005). People's access to resources is more important for poor people in developing countries, including Nepal, where land resources are institutionally and geographically limited, to meet the basic needs of the people (Chhetri, 2006; National Planning Commission, 2007). The land available for many rural households in Nepal is meagre; 47% of the people have landholdings of less than 0.5 ha, 60% of farming households have a food deficit and over 20% of farmers are landless (National Planning Commission, 2006). As a result, approximately 31% of Nepalese live below the poverty line of US $12 per person/per month (National Planning Commission, 2007) . About 80% of the working population lives in rural areas and depends on subsistence farming for their livelihood (National Planning Commission, 2007; Pradhan & Shrestha, 2005)**.** Most households in rural areas have little access to primary health care,

education, clean drinking water or air and sanitation services. Life is a continuous fight for survival for the most vulnerable groups, ethnic people and women (Dach, et al., 2006; Pradhan & Shrestha, 2005).

The idea for the delegation of a certain amount of responsibility and authority over forest resources to local communities, in the form of CF, was stimulated by several factors. Among them, Larson and Ribot (2007), Pokharel (2002), Soussan, Shrestha and Uprety (1995) and Hobley (1996) articulated three factors: first, failure of the modernization approach that started after the end of the Second World War with its large scale and centralistic approach to alleviate rural poverty and income disparities in developing countries including Nepal. In 1957, one of the effects of this centralistic development approach was that the forest was nationalised to supply railway sleepers to India and to collect revenue to build infrastructure. The Nationalisation Act 1957 alienated people from forest but since the state could not protect forest resources from encroachment; this led to fast degradation and collapse of forest cover in Nepal (Gautam, Shivakoti, & Webb, 2004; A. L. Joshi, 1993). The second factor was the development of the new paradigm of planned intervention, which used a bottom up approach with the belief that local residents should play a meaningful role in decisions affecting their surrounding forests. Community people are increasingly seeking more say in how local forests are managed and used. The third factor was the surge in the demand for human rights and the indigenous people movement in the mainstream of development to alleviate the poverty of most rural poor. CF is one way in which this desire can be met (Banjade, et al., 2006; Brown, Malla, Schreckinberg, & Baginski, 2002; Freeman, 1997; Kanel, 2005; Roberts & Gautam, 2003).

Local people often act with greater accountability than other stakeholders in forests, such as timber contractors, since the effects of forest management decisions have a more direct impact on them (A. Agrawal, 2001). In the context of Nepal, CF is a local-level forestry activity, implemented on communal land. Local users participate and collectively make decisions in planning, managing, and establishing forests for ecological benefits and harvesting forest crops for their basic needs for forest products and for selling surplus products for their socioeconomic development. Rath (2006) stated:

> "Community forestry, social forestry and rural development forestry are more or less equivalent and reflect Abraham Lincoln's view of democracy - government of the people, by the people, for the people." (, p.2))

The goals and objectives of CF will vary according to individual community needs and aspirations and whether it is a developed country or a developing country. In a developing country like Nepal, the aim is to meet the basic needs of the community for such commodities as fuel wood, fodder, building materials, medicines and food (A. Agrawal, 2001; A. Agrawal, Chhatre, & Hardin, 2008; Brown, et al., 2002; B. K. Pokharel, 2002; Roberts & Gautam, 2003). The goal of CF in developed countries is to strengthen community stability including reducing unemployment, by enhancing sustained economic benefits from forestry (Larson & Ribot, 2007). However, in both developed and developing countries, CF aims to alleviate poverty and environmental degradation (Mallik & Rahman, 1994).

Appropriate management of forest resources could make a large contribution to poverty alleviation, climate change mitigation, biodiversity conservation and forest resource sustainability. Appropriate management could also generate community income from processing and selling forest products and support other development activities. In addition, it could also prove to be one potential tool to set up good governance. Consequently, CF could serve as a development vehicle in rural societies (A. Agrawal, 2001; B. K. Pokharel, 2002; Sunderlin, 2006).

Currently, government policy in Nepal is aimed at achieving the Millennium Development Goals (MDGs) for environmental conservation and poverty reduction. The government incorporated a Poverty Reduction Strategy in the 10$^{th}$ Five Year Plan -2002 to 2007 (National Planning Commission, 2005) and the Interim Three Year Plan (2007-2010) (National Planning Commission, 2007)**.** CF can play a significant role in contributing to poverty reduction by creating sustainable livelihoods and a stable environment if the government makes forest policy, Acts, Regulations and directives to favour the poor and disadvantaged people, particularly in the distribution of CF benefits (Acharya & Acharya, 2007; Adhikari, 2005; Adhikari, Di Falco, & Lovett, 2004; Adhikari, Williams, & Lovett, 2007; Baland, Bardhan, Das, Mookherjee, & Sarkar, 2007; Dhakal, et al., 2007; Fisher, 2007; Iversen, et al., 2006; James & Bruno, 2006; Kanel, 2006; Kanel, Poudyal, & Baral, 2005; Maskey, Gebremedhin, & Dalton, 2006; B. K. Pokharel, Stadtmüller, & Pfund, 2005; Vermeulen, et al., 2008). Without addressing the problems of CF product distribution, there is little chance of using the economic potential of natural resources to reduce rural poverty (Gilmour, Malla, & Nurse, 2004; Malla, Neupane, & Branny, 2005).

## 1.2 Statement of the Research Problem

Despite the potential of CF to alleviate poverty, results have been mixed. Studies show that the CF programme has been successful in increasing forest stocks including conservation and regeneration (Gilmour, et al., 2004; Kanel, 2006; Malla, et al., 2005). However, it has not been as successful in alleviating poverty (A. Agrawal, 2001; Dhakal, Bigsby, & Cullen, 2006; B. K. Pokharel, 2002) and the share of CF benefits has gone to fewer poor households than wealthier ones (Adhikari, et al., 2004; Kanel, 2006; B. K. Pokharel, et al., 2005; W. R. Rechlin, Hammatt, Burch, & Song, 2002). There are two schools of thought about what is preventing CF programmes from benefitting the poor and successfully alleviating poverty. One school of thought argues that central government policies might have constrained the use of forests under CF in a way that limits the pool of benefits (Adhikari, et al., 2004; Dhakal & Bhatta, 2010; Dhakal, et al., 2006; Kanel, 2006; B. K. Pokharel, et al., 2005; W. R. Rechlin, et al., 2002). The effect of government policy constraints has been studied by Dhakal et al. (2006) who found that policy constraints can limit the economic benefits from CF and the ability of poor households to meet their basic needs from CF.

The other school of thought argues that the social structure of Nepal, with its traditional caste and wealth structures, can lead to decision-making, including in forest management that may not meet the needs of poor people as they expected (James & Bruno, 2006). The forest policy does not dictate how CF members should behave in terms of sharing power (Lachapelle, Smith, & McCool, 2004). The organisation of Community Forestry User Groups (CFUGs) has led to power relationships that effectively leave the poor out of the decision-making processes (Jiaqi, Zachwenuk, & Yongjun, 2004; Malla, et al., 2005). The present social structure, in terms of wealth inequality, caste, and regional disparity, influences decision-making and consequently determines benefit distribution (Rao, 2010). There is a need to understand whether social structure affects decision-making in CFUG institutions and the benefit distribution of community forests in Nepal.

Previous studies have attempted to understand benefit distribution issues in Nepal at the CFUG level. However, there are many limitations with these studies. For example, Adhikari et al. (2004) studied household-level factors determining benefit distribution from community forests, but did not look at institutional problems at the user group level. Maskey et al.(2006) studied institutional effects on benefit distribution at the CFUG level. However, the study was based on only one user group. Dhakal (2006) studied institutional characteristics

determining benefit distribution of community forests but limited the analysis to charcoal distribution, which is a special case. That study did not cover major products such as timber, firewood and fodder.

This study attempts to fill the deficiencies in previous studies by examining the social structures in CFUGs and how this influences the decision-making of CFUG institutions and benefit distribution from community forests. In community forestry, the CFUG is an organisation that consists of representative CFUG members who meet periodically as an assembly. The assembly forms an Executive Committee (EC) that executes the rules and programmes on behalf of the CFUG. The composition of the EC is thus a critical issue in terms of decision-making and the sharing of benefits obtained from CF. In principle, the EC should have representation from all social structure members such as castes and wealth. The EC should include rich, medium, poor and poorest households. It should also consist of the elite[1], *Dalit*, and *Janjati* castes. In this way its decisions will reflect the needs and desires of all members, particularly socially disadvantaged groups who rely on the forests for their basic needs of firewood, timber, fodder and leaf litter.

It is believed, however, that EC members mostly represent the elite caste and wealthier households (Jones, 2007; Malla, et al., 2005). The key question is thus whether membership of the EC is representative of all social groups' membership and, if not, what factors determine membership of the EC and the benefit distribution derived from CF. In particular, the aim of this research is to address the following research questions:

1. What factors determine who is on the EC, and what factors are important for ensuring poor and disadvantaged groups are represented on the EC?
2. Does the structure of the EC affect who gets benefits from the community forest, particularly the poor and disadvantaged?
3. Does the structure of the EC affect the distribution rules of community forest products in a way that impacts on benefits, particularly for the poor and disadvantaged?

As explained above, there are two schools of thought about what prevents CF programmes from improving the livelihoods of the poor. The first school of thought is the constraint of the policy of the central Nepalese Government and the second is internal management issues within the EC due to the social structure of Nepalese society (conventional ethnic groups and

1. Elite caste used for this study is Bahun (Brahmins) Chhetry, Thakuri and Newar caste of Nepalese society.

castes). However, it not understood how social structure, including the organization of CFUGs, might affect the distribution of benefits to poor and marginalised households. This study endeavours to examine the role of social structure, including CFUG organisations, in distributing the benefits of CF and to fill the gaps in previous studies. Hence, the stated objectives for this study are as follows.

## 1.3 Objectives

The general purpose of the study is to identify and analyse the impacts of social structures and the decision-making processes of CFUGs and to determine if they are linked to the flow of benefits from CF to different sections of the society. This will be done by focusing on the following specific objectives. The study will:

- Evaluate the leadership composition of the executive committee of CFUG;
- Examine the effect of the EC structure on the benefits from the community forest;
- Examine the effect of the EC structure on the distribution rules for community forest products; and,
- Draw conclusions about the policy interventions necessary at the community level to ensure poor households benefit from CF.

## 1.4 Research Hypotheses

The research questions will be studied by testing the following hypotheses.

1. There are factors not related to the wealth or caste that increase the likelihood of being on the EC.
2. When the EC has the more disadvantaged groups represented there are more benefits distributed from CF, and more benefits to the poor.
3. When the EC has the more disadvantaged[2] groups represented, decision rules are more favourable to the poor

Organisation of the Thesis

Following this introductory chapter, there are eight chapters organised as follows. The resources and economic panorama of the country are reviewed in Chapter Two. A review of

2. The disadvantaged members referred to in this study are lower caste and marginalised group in Nepalese society.

theories addressing the research hypotheses is the focus of Chapter Three. Chapter Three develops an understanding of how to analyse and evaluate community-based natural resources management (CBNRM) and institutional arrangements for more efficient connection to the poor and disadvantaged groups for decision-making and benefit distribution. The conceptual framework model and community welfare maximization are also reviewed in Chapter Three. The empirical framework for analysing the leadership positions and decision-making for benefit distribution from CF are reported in Chapter Four. The research method for collecting and analysing the relevant primary and secondary data is discussed in Chapter Five. The research findings are reviewed in Chapters Six, Seven and Eight. Chapter Nine presents the summary of the research with relevant conclusions and policy implications. Finally, that chapter also assesses the recommendations of this research for policy makers and for researchers working in CBNRM.

# Chapter 2
# RESOURCE AND ECONOMIC OVERVIEW

## 2.1 Introduction

This chapter focuses on Nepal's socio-economic setting and natural resources. Social structures and institutions are influenced by social hierarchy, deriving from, and subject to, the changing economic requirements of evolving societies. This concept will be used to derive the hypotheses and research model to address the research problems explained in Chapter One. First, the chapter describes the history and characteristics of forest resources and their significance for inspiring the livelihood of rural Nepalese society. Secondly, the chapter depicts the CFUG institutions and how, at the local level, these institutions manage the distributional system and practices for common pool resources. Finally, the chapter concludes with a discussion of the economic overview of the country.

## 2.2 Socio-economic Setting of Nepal

Nepal remains one of the poorest countries in the world, with a per capita income of US $440 per annum (World Bank, 2010). It has wide income disparities and poor access to basic social services by a large section of the population. It is also one of the few developing non-coastal countries of the world. It is situated between China and India with a total area of about 14.7 million hectares of rectangular shape extending from east to west. The country ranges from the lowest point, *Kachnakalan*, at 70 metres above mean sea level (amsl) to 8,848 metres amsl in the north with the highest peak, Mount Everest. Mountains and hills cover over 80% of the total land area of the nation. Many rivers and streams originating from the Himalayan glaciers cross the country from north to south. Due to its varied topography and elevation, annual precipitation also varies greatly from one point to another, ranging from 250 to 4500 mm. Land use, forest resources and the socio-economic situation of the nation vary with the ecological zone (Master Plan for Forestry Sector, 1989).

The country is divided into three broad physiographic regions: the Mountain Region, the Hill Region and the *Terai Madhesh* (Plain) Region (Figure 2.1). These regions run naturally parallel to each other, from east to west, as constant ecological belts, occasionally bisected by rivers. The physiographical composition of Nepal is described in the following section.

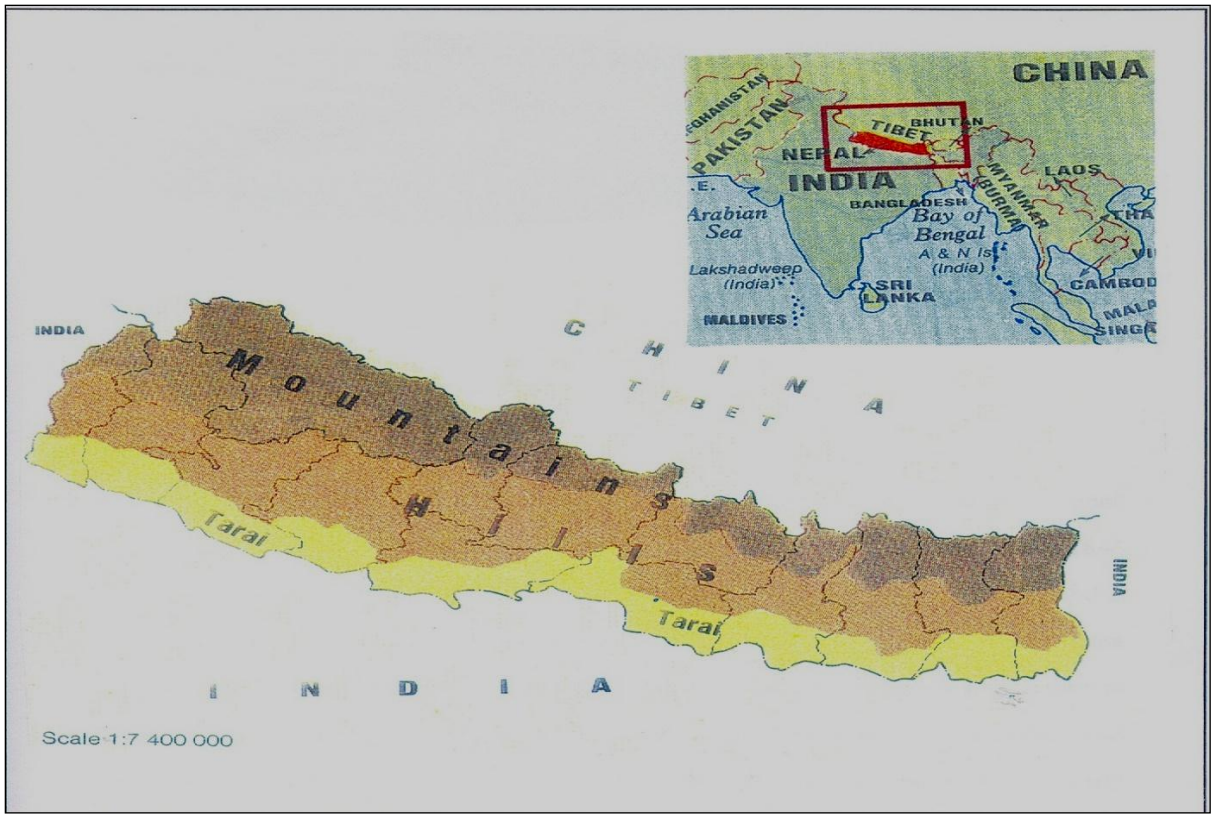


Figure 2.1 Map of Nepal showing the three physiographic regions source: (B. D. Yadav, 1996)

### 2.2.1 The Mountain Region

The mountain region ranges from 1,000 metres to 4,000 metres or more amsl. The natural landscape comprises Mount Everest and eight of the world's 10 highest peaks. The snow line occurs commonly above 5,000 metres. The landscape of this region is characterized by its severe climatic and rugged topography. Human habitation and economic activities are extremely arduous to perform. Pastoralism and trading are the common economic activities among the mountain dwellers (Master Plan for Forestry Sector, 1989). The populace is very sparse throughout the region. The existing farming activity is mostly limited to the low-lying valleys and the river basins. This region covers 34% of the total land area of Nepal and about 13% of the land area of this region is under agriculture (National Planning Commission, 2005). The main ethnic groups of this region are *Sherpas*, *Dolpas*, *Lopas*, *Baragaonlis* and *Manangese* (Bistha, 1991). The *Sherpas* are mainly found in the east in the *Solu* and *Khumbu* regions; the *Baragaonlis* and *Lopas* live in the semi-desert areas of Upper and Lower Mustang in the Tibetan rain-shadow area; the *Manangese* live in the *Manang* district; and the *Dolpas* live in the *Dolpa* district of West Nepal, one of the highest settlements on earth, at 4,000 metres (Gurung, 2005). The main forest species of this region are *Pinus wallichiana*,

*Picea smithiana, Abies spectabilis, Juniperus wallichiana, Taxus baccata*, evergreen *(Quercus semecarpifolia, Rhododendron campanulatum*), and deciduous broadleaved species (*Betula utilis, Populus ciliata, Sorbus cuspidata*) spreading from 2,400 m up to the tree line at 4,200 m amsl (Dobremez, 1976; Lillis, Matteucci, & Valentini, 2005).

### 2.2.2 The Hill Region

The hill region is situated between 1,000 and 4,877 metres amsl and includes the major urban centres of Kathmandu, *Pokhara* and *Surkhet*. This region is the political and cultural centre of Nepal, with decision-making power centralised in Kathmandu. Crop agriculture is the predominant economic activity supplemented by livestock. This region covers 48% of the total land area of Nepal (Master Plan for Forestry Sector, 1989). The main land use pattern of this region is categorised as cultivated land, non-cultivated inclusions, grasslands, forestlands, shrub lands, and other sorts of land use. Over half of the inhabitants live in the mountainous areas and most depend on agriculture for their livelihood. Nearly 33% of its land is under agriculture. The ratio of agricultural land to farming population is only 0.12 ha/capita. Consequently, the hill residents are forced to seek off-farm employment through both seasonal and permanent migration to the *Terai* and urban areas (Bistha, 1991; Gurung, 2005).

There are multiple castes and diverse ethnicity in the middle hills with a significant number of communities belonging to hierarchy single ethnic groups (Hofer, 1979). Some of the main castes are *Brahmins, Chhetry, Newars, Gurungs, Tamangs, Thakalis, Magars, Rais, Limbus* and *Donuwars*. Most of the populace in this region depend on subsistence farming with a few other options for livelihood opportunities (Gurung, 2005). Livestock is an integral part of this subsistence farming system, which provides a source of protein and drafting power for farmers.

The forests of this region are surrounded by cultivated agricultural lands with a few dense forests on the top edges of the mountains. All accessible forests have a high potential to be managed under community forests (Master Plan for Forestry Sector, 1989). The main tree species of this region are subtropical pine forest (1,000-2,200 m amsl). South facing slopes of the Siwalik and the mid-hills in the western and central regions are dominated by Chirpine (*Pinus roxburghii*). Lower temperate broadleaved forest occurs from 2,000-2,700 m amsl in the west and 1,700-2,400 m amsl in the east. The mid-hills forests with *Alnus nitida, Castanopsis tribuloides, Castanopsis hystrix, Lithocarpus pachyphylla, Quercus* spp. and

*Alnus nitida*, are confined to the river banks of the *Mugu Karnali* (2,130-2,440 m amsl). In west Nepal, *Quercus leucotrichophora, Q. lanuginosa* and *Q. floribunda* forests dominate with other associated species. Central and eastern parts have *Q. lamello*sa forest; *Lithocarpus pachyphylla* forest occurs in the east. Lower temperate mixed broadleaf forest (1,700-2,200 m amsl) is generally confined to the moister north and west-facing slopes, with several tree species of Lauraceae prominent (Dobremez, 1976; Stainton, 1972).

Upper temperate broadleaf forest (2,200-3,000 m amsl) on drier south-facing slopes of central and eastern parts has *Q. semecarpefolia* forest. Upper temperate mixed broadleaf forest (2,500-3,500 m amsl) is mostly found in the central and eastern regions, mainly on the moister north- and west-facing slopes. *Acer* and *Rhododendron* spp. predominate here.

### 2.2.3 The *Terai Madhesh* Region

In contrast to the Mountain and Hill Regions, the *Terai* Region, also called *Madheshh*, is a lowland tropical region comprising 18% of the total area of the country. This region is a subtropical belt of flat, alluvial land stretching along the Nepal-India border parallel to the Hill Region. It is the northern extension of the Gangetic Plain in India, which commences at about 70 m above sea level and rises to about 1,000 m at the foot of the Siwalik Range. The region was formed, and is fed, by three major rivers: the *Koshi*, the *Narayani* (India's *Gandak* River), and the *Karnali*. In the past, this region contained malaria-infested, thick forests, commonly known as *char kose jhadi* (dense forests approximately 12 kilometres wide). The *Terai* was used as a defensive frontier by Nepalese rulers during the British rule (*Raj)* (1858-1947) in India (A. L. Joshi, 1993; Metz, 1991).

In terms of both farm and forest lands, the *Terai* is becoming the richest economic region of Nepal. Overall, the *Terai* Region has a greater availability of agricultural land than other regions due to its flat terrain. About 64% of its land area is under agriculture (A. L. Joshi, 1993). Natural vegetation consists mainly of Sal (*Shorea robusta)* and associated species including riverine forest. In addition, it still has the largest commercial forests (World Bank, 2006). In the early 1990s, the forests were being increasingly destroyed because of the de-facto forest policy of the government that clear-felled forests for the settlement of hill migrants to provide agricultural land for this populace (Metz, 1991). Migration from the mountains to the *Terai* for expanding agriculture land and settlement is still a problem (Chakraborty, 2001).

The *Terai* is the main farming region in Nepal, providing much produce for the rest of the country. Rice, maize, jute, tea, tobacco and sugarcane, along with a variety of fruit, are all grown here and sent to the major cities and towns in Nepal and even for export (Gurung, 2005; Lawoti, 2001). In the *Terai* Region, there are also major differences within the agricultural sector. In eastern *Terai,* 16% of the population are farm workers compared with 5% in western *Terai*, with a corresponding higher share of self-cultivators in the west (Hatlebakk, 2007).

The main forest species of this region are *Dalbergia sissoo*, *Eucalyptus* spp. and *Tectona grandis* (teak), particularly in *Sagarnath* and *Nepalgunj*. Plantations in the mid-hills comprise *Pinus roxburgii, P. wallichiana, P. patula* and *Alnus nepalensis* (Gilmour, King, Applegate, & Mohns, 1990). Tropical moist lowland forest species (between 1,000 and 1,200 m amsl in the Churia Hills) are predominantly Sal (*Shorea. robusta*). *Acacia catechu* and *D. sissoo* replace Sal in riverine forests. Other riverine forest types include evergreen species, such as *Michelia champaca,* or deciduous species, such as *Bombax ceiba*. In the foothills of western Nepal, Sal forest is replaced by *Terminalia/Anogeissus* (Ministry of Population & Environment, 2004). Dobremez (1976) described that as subtropical broadleaf evergreen forest (1,000-2,000 m amsl). Central and eastern parts have *Schima wallichii/Castanopsis indica* forest. (Dobremez, 1976) also explained that, in the riverine forest of toona (*Cedrela toona*), *Albizia* occurs low down along the valley sides of large rivers (e.g. Arun Khola). *Alnus nepalensis* is widespread along streams and in moist places. Subtropical pine forest (1,000-2,200 m amsl) on the south facing slopes of the Siwalik and the mid-hills in western and central regions is dominated by Chirpine (*P. roxburghii).*

## 2.3 Forest Resources

Forest covers about 4.27 million hectares (29%) and shrubs cover 1.56 million hectares (10.6%) of a total land area of 14.72 million hectares in Nepal (Härkönen, 2002; Nagendra & Gokhale, 2008; National Planning Commission, 2007; World Bank, 2006). The populace of Nepal has predictably depended on forests for basic needs, firewood, timber, fodder and non-timber forest products (NTFPs) (Malla, et al., 2005). The economy of the country largely depends on the use of natural resources. The growing population has put huge pressure on forests for cultivable land, especially in the Terai Region, which also supports many landless migrants from the hills (A. L. Joshi, 1993). The endorsement of the Forest Act 1993 and

Forest Regulations 1995 by the government has shifted nationalized forests from state control to local communities.

In 2006, there were 16,840 CFUGs with 1,711,097 households in 74 of 75 districts in Nepal covering 1,217,172 hectares of forest land, which is over 25% of Nepal's forest land (Kanel, 2005). Management of the forests by communities in the form of CF has resulted in the creation of community funds raised by selling timber, firewood, NTFPs, CFUG members' fees, penalties and obtaining donor assistance. These funds are used to construct roads, bridges and schools, the promotion of drinking water and paying teachers' salaries (Dev, Yadav, Baginski, & Soussan, 2003). Moreover, CF also contributes to growth in social capital by empowering women, weaker castes and oppressed groups towards increased participation in decision-making and increasing human capital through workshops and training (B. K. Pokharel, et al., 2005).

Nepal largely has a subsistence economy. The GDP of Nepal is US$3,063 million and the per capita income is US$440 (World Bank, 2010). Both agriculture and forestry have played a central role in the development of the economic and social life of the rural people. The share of agriculture, forestry and fishery in the GDP is about 60% with forestry contributing about 15% (National Planning Commission, 2007). At present, there is a need for an environmentally sensitive approach to agricultural development in Nepal. Because of the growing deterioration of ecosystems, the scarcity of fodder and fuel, the loss of soil fertility and its impact on household food and energy security, the approaches to be promoted must be carefully selected (S. P. Yadav, 2004). The next section explains the poverty setting within the Nepalese economic panorama.

## 2.4 Poverty Setting

Many factors contribute to chronic poverty in Nepal's steep and mountainous areas. However, one factor associated with poverty is the deeply entrenched and complex phenomenon of 240 years of feudal kingship. Approximately 31% of Nepalese live below the poverty line of US$12/person/month (National Planning Commission, 2007). Most households have little or no access to primary health care, education, clean drinking water or sanitation services. Rural communities are generally illiterate, have large families, and are landless or have only very small landholdings. Small, fragmented subsistence farming is characteristic of Nepalese agriculture; the average landholding is only 0.8 hectares (Dhakal,

et al., 2006). Life is a constant struggle for survival. The most vulnerable groups are the lowest social castes, indigenous people and women.

Poverty, lack of economic growth and increasing marginalization has resulted from 10 years of political unrest and violence in Nepal. A Maoist rebellion that began in 1996 in the remote hill districts of the mid-western region later intensified and spread across large parts of the country. Over 14,000 Nepalese were killed in the conflict and about 600,000 were internally displaced or made homeless (Baral & Heinen, 2005; National Planning Commission, 2006; M. A. Rechlin, et al., 2007). In addition, over two million people were believed to have fled to India. Fighting occurred largely in rural areas so agricultural production was jeopardised. Many rural and remote regions have been kept isolated. Agricultural production declined severely and business investment ground to a halt. Overall, the conflict wreaked havoc on the country's economic performance (National Planning Commission, 2007). Following a ceasefire in April 2006, steps have been taken to bring the decade-long conflict to an end.

Social discrimination, both in *Madesh Terai* and the hills, plays a significant role for most disadvantaged, poor and marginalized citizens in Nepal (Central Bureau of Statistics, 2001, 2009; B. K. Pokharel, 2002). Small farmers, landless labourers, lower castes, indigenous people and women are further forced into discriminated-against groups in *Terai* (Chaudhary, 2006). Discrimination on the grounds of caste is officially illegal in Nepal but is, in fact, widespread, especially in rural areas (Bode, 2009; Gurung, 2005). Members of the lowest caste (*Dalit* or untouchable) are the most disadvantaged group (Bistha, 1991). Most people in the *Dalit* caste work as wage labourers for higher-caste farmers.

## 2.5 Agriculture Milieu

Agriculture dominates the Nepalese economy. Although only 20% of the total land area is under agriculture, in the late 1990s, agriculture was the main source of livelihood for more than 85% of the inhabitants (A. L. Joshi, 1993). Nepal obtains, on average, about 60% of its GDP from agriculture (National Planning Commission, 2007; K. Singh, 1988). Low production and fluctuations in yield have been major hurdles in the agricultural sector. The main challenge is to commercialize conventional agriculture with up-to-date mechanisation and industrialisation of agricultural production (National Planning Commission, 2007). The main obstacles are government policy and the traditional beliefs of leaders. Any government that obtained power after a shift from one political system to another usually attacked

agricultural land, in particular the fragmentation of agriculture land into smaller sizes, in *Terai*, in the name of modernisation of agricultural policy and revolutionary reform in agriculture (Metz, 1991). To become popular, politicians bank votes from the poor and landless people with the agenda of distributing agricultural land and settling them in the *Terai's* high yielding forest land to develop agriculture to sustain their livelihoods (A. L. Joshi, 1993; Metz, 1991). These politicians have never accepted the wisdom about infrastructural development or scientific land reform that preferred larger land sizes to handle modern agricultural tools and equipment to capture optimum products and to revolutionize the agricultural sector. The Federal Government of Nepal has developed an Agricultural Perspective Plan (1997-2016) that focuses on increasing agricultural production, controlling irrigation, meeting the demand for fertilizer, and amending the Act to abolish the dual system of ownership throughout the country so that ownership is provided to all tenants (National Planning Commission, 2007). However, the current Agriculture Perspective Plan relies too much on growth as the engine for addressing poverty and does not address a mechanized land reform system. It means that farms, in fact, are very small in that they serve simply as family havens where a few vegetables and cereals can be cropped (Thiesenhusen, 1991). The Nepalese policy makers have not decided to unite the fragmented land and start farming with machinery and equipment to broaden the economic gains of the nation. There are three types of private agricultural land in Nepal:

**Rice Land (*Khet*):** *Khet* land is clearly defined cultivated land. It is invariably put under rice cultivation during the monsoon. At altitudes below 2,000 m amsl, rice is grown on suitable land where some irrigation is available (Land Resource Mapping Project, 1986). Rice land is at least partially irrigated during the monsoon.

**Cultivated Land (*Bari*):** *Bari* land in the hills and mountains occurs mostly on slopes between 15 and 25 degrees (27 to 47%). It is not unusual to observe slopes of over 30 degrees (about 60%) brought under cultivation (Land Resource Mapping Project, 1986). The Bari lands on the slopes are constructed as outward sloping terraces with the intention of draining excess water throughout the monsoon. *Bari* land is the dominant practice in the hills and mountainous regions with an area of 1,708,000 hectares of drained agricultural land in Nepal, which amounts to approximately 65% of the total cultivated land (Land Resource Mapping Project, 1986). Maize is the dominant crop of *Bari* land followed by cereals, pulses or mustard, or mixed crops, such as millet mixed with potatoes, particularly at higher altitudes.

**Cultivated land (*Butyan*):** The *Butyan* land in the hills and mountains occurs mostly on slopes between 20 and 35 degrees (35 to 58%). This is suitable for tree species, particularly for fodder, firewood, and horticultural crops (Land Resource Mapping Project, 1986; Stainton, 1972). This land is inappropriate for cultivation of crops such as wheat, rice or cereals.

## 2.6 The History of Forest Management

Human beings and forests have always had a multifaceted relationship. Humans have depended on forests as long as people have inhabited the planet. They provide clean air to breathe, food and water to survive, fuel for energy and shade for shelter. Humankind's past is linked to the forest and it is easy to perceive how its survival will map our future (Stainton, 1972). Currently, it requires significant inputs to provide for the requirements of human life in developing counties such as Nepal. Forests can provide both direct and indirect livelihood benefits including products and services for the "sustainable livelihoods" of farmers. Forests and trees are an integral part of the farming system. Farmers must have access to forests and trees for leaf litter, fodder, animal bedding and firewood, as well as timber for the construction of buildings and agricultural equipment. Forest management has gone through a process of development in Nepal over the last few centuries. There have been various forest policies and legislation to manage forests and solve the needs of local people. The approaches implemented can be broadly divided into the periods 1769-1957, 1957-1976, 1977-1988 and post 1988 (Gautam, et al., 2004; A. L. Joshi, 1993; Master Plan for Forestry Sector, 1989).

**From 1769 to 1957**

Before the Shah King of *Gorkha* united Nepal in 1769, the land was divided into a number of kingdoms. Each kingdom had its own administrative rules and practices (Metz, 1991). As the populace was small and forest lands were abundant, the earlier rulers had great opportunities to expand agricultural land after clearing the forest. The underlying reason for deforestation was because there was no provision to collect revenue from forest land whereas federal rulers collected tax from agricultural land (Gautam, et al., 2004). Therefore, they encouraged individuals to convert forests into agricultural land. One school of thought was to protect, manage and utilize privately owned forests. Consequently, the forests were snatched by the rulers from their traditional owners. The forests of *Terai* were re-distributed to royal family members, relatives, army officers and other employees as gifts and the *Birta*, *Math*, *Jagir* and

*Terai* people, who were the traditional forest owners of those forests were compelled to work as forest tillers (Metz, 1991). By 1950, 75% of *Birta* forest was converted into agriculture and ownership transferred to higher caste *Rana* (A. L. Joshi, 1993) and royal families (Metz, 1991).

Due to malaria in the *Terai*, people from the hills did not want to migrate there (Metz, 1991; Stainton, 1972) . Therefore, federal rulers tried to shift hill people to the *Terai* by providing a number of incentives/facilities to people who wanted to migrate. For example, the federal rulers developed the tax holiday system for the immigrants whereby taxes could be avoided in three different ways (Metz, 1991; Salamat, 1989; K. Singh, 1988). Firstly, if a farmer chose to convert forest into agricultural land, he could enjoy a three-year tax holiday. Secondly, a farmer could obtain a *Jagir (*be employed in the Public Service), which was an assignment to the military. The compensation for the *Jagir* was the right to the taxes from particular land. *Jagirs* were necessary because of the uncertain political climate in Nepal (Metz, 1991). The military was financed almost entirely by land and labour taxes. These appointments were renewed annually and provided for insecure land tenure. Thirdly, a farmer could obtain a *birta*, which was an assignment of a piece of land as a bonus for some work done for the king. Despite this, Gautam et al. (2004) argued that *Terai* forests were not widely disturbed until the late 1920s when the government started to expand the agricultural area by clearing forests and extracting timber for export to India in order to collect revenue. The Department of Forests (DoF) in Nepal was established in 1925 with the main objectives to administer timber exports to colonial British India and to allocate wood and capital to the ruling king[3] and the *Rana* families[4] (Kanel, et al., 2005; K. Singh, 1988). The government hired an experienced British forester (J.V. Collier), with long working experience in India, who provided a report to the government in 1928 recommending the cutting down and removing of all trees from the *Terai* forests and converting the land to agricultural land and settlement (Graner, 1997).

**From 1957 to 1976**

The government nationalised all private forests in 1957 through the Private Forest Nationalisation Act. Its main intention was to reclaim the *Birta* land that had been given as presents to individuals for special services to the kings. The Forest Act 1957 led to

3. An autocratic monarch ruled Nepal from 1769 to 2008.
4. An aristocratic family that ruled Nepal from 1846 to 1951.

tremendous controversy affecting the management of forests (Metz, 1991; K. Singh, 1988). Hobley (1996) and Messerschmidt (1993) argued that this nationalisation destroyed the indigenous management of private forests in the hills and deprived the local people of rights and authorities to a share of the benefits obtained from forests. This meant open access to forests. However, due to the shifting of the management system from one pattern to another, there was a need for efficient forest officers and leaders to implement the aims of the Act (Gilmour & Fisher, 1991; A. L. Joshi, 1993). However, due to inefficient and insufficient manpower in the forestry sector, the forest land could not be removed from the royal family and *Rana* relatives in the *Terai*. In 1960, the juvenile democracy was replaced by the *Panchyat party-less* political system by King *Mahendra*. The Forest Act 1961 was formulated with a special feature that prescribed several types of penalties (A. L. Joshi, 1993). In an attempt to further strengthen the role of forest officials and the forest department in controlling deforestation, the Protection (Special Provision) Act 1967 was promulgated (A. L. Joshi, 1993). This Act contained a strong rider and intense penalties for any person who entered forests for even a small forest product without official permission. None of the Acts and Regulations of the government was able to produce the desired results for the sustainable management of forests.

In 1962, the Operational Forest Management Plan (OFMP) was developed by the Department of Forests (A. L. Joshi, 1993). However, it was never implemented due to a lack of political commitment and the inability of foresters in the Department of Forest (DoF) to convince the politicians and local communities to implement it even though the OFMP was favoured by local communities (A. L. Joshi, 1993; K. Singh, 1988). The removal of malaria in the *Terai* throughout the 1950s and the 1960s encouraged a huge migration of people from the mountains and hills to the *Terai* in search of fertile agricultural land (Gautam, et al., 2004). From 1950 to 1980, a total of 103,968 ha of forest in the *Siwaliks* and the *Terai* were cleared under settlement programmes (Master Plan for Forestry Sector, 1989). An additional 100,000 ha were illegally encroached on during the same period by powerful landholders in the hills and mountains in the name of the *Sukumbashi* (homeless and landless) (A. L. Joshi, 1993). The intention of those settlement programmes was to settle the political elite who supported the party-less system of King *Mahendra* (K. Singh, 1988). In practice, the policy indirectly encouraged illegal encroachment of forests for cultivation (W. J. Jackson & Ingles, 1995). The people encroached on the forest land with the hope of registering the land as private property once the land was cleared and cultivated (Baland, et al., 2007; Wallace,

1981). Consequently, all factors for the degradation of Nepalese forests, including encroachment and settlement, came together quickly. Between 1947 and 1976, Nepal's forest cover declined from 57% to 23% of the national area (Upadhyay, Sankhayan, & Solberg, 2005).

**From 1977 to 1988**

After a series of international meetings, the Seventh World Forestry Congress meeting was held in Buenos Aires in 1972 with the theme "Forest for Socio-Economic Development" (Food & Agriculture Organisation, 1978). It placed emphasis on forestry for increasing agricultural production, supply of energy, and generation of employment by creating a sustainable ecosystem. Similarly, the Eighth World Forestry Congress meeting in 1978 concluded with the outcome "Forest for People" that guided the Nepalese Government to recognise the need for people participation in rural development, including forestry projects, with the emphasis on a "bottom up" approach to overall planning and implementation. The following statement illustrates the importance of forestry for rural development

> "Forest development will be consciously directed towards the rural development and eradication of poverty…governments should lend support to institutionalise self-reliant mechanism…based on endogenous decision-making and the full participation of rural people" (Food & Agriculture Organisation, 1980, p.9).

In 1978, the World Bank projected a similar vein in the "Theory of Himalayan Environmental Degradation" stating that hills and *Terai* (plain) forest of Nepal would be entirely depleted within 15 to 25 years (Devkota, 2005). The national forestry inventory (NFI) of 1998 with the previous land use study - 1978-1979 Land Resource Mapping Project (Land Resource Mapping Project, 1986) led to the conclusion shown in Table 2.1 that forest cover decreased at an annual rate of 1.8% and shrub land decreased 0.5% between 1978 and 1994.

Table 2.1 The annual percent decrease in forest and shrubland area in Nepal in various time periods

| Region | Category of area | Decreased area (%) | Period |
|---|---|---|---|
| Terai | Forest | 1.3 | 1978-1979 to 1990-1991 |
| Hills | Forest | 2.3 | 1978-1979 to 1994 |
| Average | Forest | 1.8 | 1978-1979 to 1994 |
| Terai | Forest and shrub together | 0.8 | 1978-1979 to 1990- 1991 |
| Hills | Forest and shrub together | 0.2 | 1978-1979 to 1990-1994 |
| Average | Forest and shrub together | 0.5 | 1978-1979 to 1990-1994 |

Sources: (Acharya & Dangi, 2009; Devkota, 2005)

The reasons behind this forest loss were population growth and increased demand for forest products. According to the $10^{th}$ population census conducted in June 2001 the population of 23,214,681 was an increase of 5 million since the 1991 census, with an average annual growth rate of 2.3%. The annual per capita consumption of firewood in mountains was estimated at 640 kg, but the average in *Terai* was 479 kg (Devkota, 2005). The per capita consumption of timber was estimated 0.11 $m^3$ in Nepal (Ministry of Population & Environment, 2004).

Okley (1987) advocated that rural people are not only the solution and resources but they are also an asset for Natural Resource Management (NRM). More importantly, some factors led to the failure of industrial forestry in Nepal and led to socio-economic deterioration and an increasing rate of deforestation. On the other hand, because rural people had been preserving indigenous skills and knowledge for forest management; giving people responsibility for forest management by promoting natural and artificial regeneration and sustainable use of woodlots would enhance the institutional capacity of people (Johann, 2007; Kagoda, 2009).These were the causative factors that developed the concept of people participation in forestry management in Nepal.

While traditional forestry management approaches and gap analyses were presented in the debate at the National Forester Conference, which all District Forest Officers (DFO) and senior foresters of the Ministry attended, one District Forest Officer of *Sindhuplanchauk* (the adjoining district to Kathmandu), T.B.S. Mahat, presented his experiences and shared with the conference members ideas that were quite revolutionary in the history of forest management in Nepal (Mahat et al., 1987). The district forest programme was supported by

the Nepal Australian Forestry Project (NAFP), in which local communities were involved in protection and management. The community involvement outcomes were quite encouraging in terms of forest protection, afforestation and the establishment of plantations.

After careful consideration of the outcomes of the *Sindhuplanchauk* DFO, the conference eventually led to the formulation of the National Forestry Plan 1976. This plan became a foundation for the revision of the Forest Act 1961, which was amended in 1977. It accepted the involvement of local communities with various categories of forest management schemes including *Panchayat* Forest (PF), *Panchayat* Protected Forest (PPF), leasehold forestry and private forestry. The government developed a plan that recognised the role of local participation in forest management (B. K. Pokharel, 1997). It can be claimed that CF in Nepal was officially legalised by the Nepalese Government in 1978. The government of Nepal invited international donor agencies to support the CF programmes. As a result, many agencies including the World Bank, FAO/IBRD, DANIDA, and GTZ, agreed to support the forestry programme, including rural development activities like KHARDEP in the east and KBIDP in the west of Nepal.

In addition, forests were handed over to local leaders who represented the powerful *Panchayat* leaders. The main forest users, such as the poor and women, were unaware of the whole process so were excluded from it. In addition, the *Panchayat* was only between local politicians and the officer in-charge of the District Forestry Office (DFO) whose real interest was in the production and sale of commercially important timber rather than sustainable management to meet local needs. Such commercial interests could not be met by these forests under such policies (Springate-Baginski, Dev, Yadav, & Soussan, 2003).

Despite the Forest Act, regulations and forest officials with a similar judicial role to police, the Forest Service remained ineffective in managing forests. The service was neither able to protect the existing forests nor was it able to place the forests under sound technical or active management. Consequently, the Master Plan of the Forestry Sector was developed in 1989.

**1989 onwards**

The Master Plan of the Forestry Sector (MPFS) was developed in 1988 and adopted in 1989 to legalize the participation of local people. The main attributes of the MPFS were to meet

the basic needs for forest products by local people through CF. The other objectives of the master plan were to:

- Hand over accessible forests to users and empower Community Forest User Groups (CFUGs) to manage the forest resources;
- Give CFUGs all benefits from the handed-over forests; and
- Convert the entire forestry staff to work as facilitators and solicitors of CF.

This was a turning point in the history of forest management in Nepal, with the Forest Act 1993 and the Forest Regulations 1995 allowing the implementation of community forests. The Act and Regulations do not only recognize the CFUGs as legal institutions but also recognize participatory management of the CF as a means to satisfy the subsistence needs of CF products and generate cash to foster community-led local development (Kanel & Kandel, 2004). However, the Department of Forest (DOF) issued a circular forbidding the extraction of any forest products from CF, even for subsistence needs, unless a forest inventory was performed (Gautam, et al., 2004; Springate-Baginski & Blaikie, 2003). Recently, the Forest Policy Amendment Act 2001 imposed a 40% tax on forest products that were sold by CFUGs for commercial purposes. In 2003, the government introduced a Collaborative Forest Management Plan (CFMP) for the *Terai,* inner *Terai,* and *Churia* hill forests. A large forest block of *Terai*'s valuable timber species would be managed under the CFMP whereas barren land, shrub land, and isolated forest patches would be handed over for CF (Acharya & Acharya, 2007; Gautam, et al., 2004). Several opposition groups such as lawyer groups, the Federation of Community Forest Users in Nepal (FECOFUN) (particularly) and others, were strongly opposed to the government's policy. Many researchers and scholars have also criticised the new policy (Gautam, et al., 2004; Luintel & Chhetri, 2008; Springate-Baginski & Blaikie, 2003). Hence, in 2009, the government had to retreat from the CMFP and came with commitments to hand over the forests to local users.

## 2.7 Social Structure of Nepal

Social structure and stratification are sociological terms for the hierarchical arrangement of social classes, castes and strata within a society (Abercrombie, Hill and Turner, 2000). Nepal is a heterogeneous society with a complex ethnic mix, overlain by disparities in social and economic opportunities. The social organisational working concept of Nepalese society is based on a culture and castes that heavily affect modernisation of the nation (Gurung, 2005). Pradhan and Shrestha (2005) and Bistha (1991) observed that the castes, women and the gaps

between rich and poor, high caste and low caste, untouchable and pure, are especially retarding Nepal's effort to develop and are, in fact, increasing the economic disparity among different sections of the people. Several governmental, non-governmental and social organizations cannot separately perform their activities beyond these structures in society.

Nepali society is based on legal hierarchical structures and the social exclusion of the 'lower' castes, women, ethnic communities, and non-Nepali speaking communities from state administration and land since 1814 AD (Bistha, 1991; Pradhan & Shrestha, 2005). These structures include Hindu religious law and, increasingly, customary law. Several ethnic groups have been more discriminated against by the elite, especially the dominant *Parbatiyas*[5] (Pradhan & Shrestha, 2005).

The caste and class system in Nepal itself imposes further constraints on the ability of people to keep contractual relations because of collective pressures that compromise the ability of people to perform responsibly. The services of the lower castes always accede to the demands made by people of higher status than themselves (Bistha, 1991). Lower castes and women form a disadvantaged group whereas men of higher castes have all the power. This makes the participation of people in development activities and the sharing of benefits of development much harder for low caste groups and women (Banjade, Luintel, & Neupane, 2004). These conventional practices are rooted in every social organisation. In the management and control of natural resources in *Himanchal Pradesh* in India, Hunt (2006) found that social-political status through stratification of castes within village populations needed to be understood in order for policy-makers to establish local institutions for rural development. Local institutions have previously shaped how the rural populace responded to environmental conservation and Natural Resource Management (NRM). They are also the mechanisms that translate the impact of future external interventions to facilitate adaptation to NRM. Because adaptation to NRM is local, it is critically important to understand the role of local institutions in shaping adaptation and improving the capacities of the most vulnerable social groups (Baland & Plateau, 1996). The next section explains the contribution of local institutions.

## 2.8 CFUG Organisations

After the massive deforestation in tropical countries and the collapse of the Californian sardine fishery and other ocean fisheries, a scholarly consensus emerged that successful local

*5. Parbatiyas is a group of castes (Bahun, Thakuri and Chhetry) who originally spoke the Nepali language.*

level organization of stakeholders is necessary to resolve problems and to derive management plans for Common Property Regimes (Ostrom, 2001). Institution refers to groups of people, players and similar interested groups of people who come together for a common goal and purpose or to achieve specific objectives (Barney, 1986; Bromley, 1989).

Community-based management of forests, in the form of conventional or indigenous systems, has a long history in Nepal (Arnold & Campbell, 1986; Fisher, 1989; Gilmour, 1990; Messrschmidt, 1993). This institution is known by various names according to regions. For example, the *Kipat* system of forest management was well established in eastern Nepal, particularly in the *Koshi* Hills (A. L. Joshi, 1993). Similarly, in the west, the *Talukdar* and *Jimbal Mukhiya* systems of forest controllers were recognized, particularly in the *Dhaulagiri* zone (Fisher, 1989). The *Birtabal* and *Raikar* systems were well known in *Terai* region of Nepal (Metz, 1991).

In contemporary CF, the Community Forestry User Group (CFUG) is an institution that has an executive committee (EC). The composition of the EC is a critical aspect of the process (Messrschmidt, 1993). In principle, it must comprise a good representation of all sectors of the users or stakeholders (Fisher, 1989; Gilmour, 1990). It must be active and the members must believe that it serves a purpose. It comprises a chairperson, vice chairperson, secretary, treasurer and several members. It is a team of 7 to 11 members, or sometimes more, depending on the population and hamlets of users. The configuration, position, and method of selection of the EC (of the CFUG) members reflects their selection and election by the users' assembly. However, the present institutions encompass political party members and the elite and wealthier who are selected for the EC of the CFUGs; very few social workers, women and poor members are selected as representatives of these groups (Bartley, Andersson, Jagger, & Van Laerhoven, 2008; Brown, et al., 2002). The committee comprises the elite and powerful people of the society who can easily influence the decision-making of the CFUGs to share benefits with the poor and disadvantaged. Malla et al.(2005) argued that different approaches are needed in order to address these organisational issues of the CFUGs and the limitations of the community as a vehicle for empowering the poor. It is not at all clear, at present, which of the various alternatives put forward could be more effective and successful in distributing benefits to the poor from CF.

## 2.9 Contributions from Other Studies

Many governments in the developing world and stakeholders are working for common property regimes expecting that local level institutions can perform a better role in the regeneration, restoration and protection of natural resources (Chakraborty, 2001). The value of local institutions is more important for developing countries, including Nepal, where land resources are institutionally and geographically limited, to meet the basic needs of the people (Food & Agriculture Organisation, 2002). Campbell and Shackleton (2001) argued that "social stratification such as race, status, caste, class and gender are outcomes of local institutions". Institutions also include social systems including economic, legal, political, cultural and other systems (Giddens, 1979).

Scholars working for participatory management of forests have studied these contexts. The study findings that are relevant here are as follows. Most studies done so far in common property issues have focused on the factors determining the success of common property management (Chakraborty, 2001). For example, Adhikari et al. (2004) studied poverty, property and collective action; the distributive aspects of common property resource management at household level factors determining community forest benefit distribution. This study examined broad concerns by investigating whether the recent policy shift toward CF resource management in Nepal had increased households' access to resources. This study also concentrated particularly on distribution problems at the household level. Maskey et al. (2006) studied the amount of household participation in the decision-making of a forest user group that was then analysed for benefit distribution. Bajracharya (2008) studied the institutional factors that influenced the access by the poor to forest benefits, legal customary rights and the network of lower castes. Her findings were based on a case study of some CF and Leasehold Forestry regimes that emphasised the development of networks and the active participation of the poor and lower castes in CF and leasehold forestry programmes.

Iversen et al. (2006) studied whether the handover of forests to the local community in *Terai* was suitable. The underlying cause was that *Terai* forestry resources are extremely valuable and the Department of Forests has been reluctant to allow CF there because of the loss of a valuable revenue source. This research was conducted in the *Nawalparashi* and *Rupadehi* districts in mid-western Terai with a small sample size and, on purpose, qualitative data were collected to explore the impacts of site contrasts on forest condition, forest values, and the role of NGOs in group formation within the buffer zone. Jones (2007) examined three

community user groups to meet the objectives of the buffer zone concept surrounding the *Chitwan* National Park. His findings explained that the national policy did not create an appropriate environment to achieve downward accountability, transparency and fairness.

The effects of social and institutional structures in determining decision-making and benefit distribution to the poorer and underprivileged groups of society have not yet been studied. This study attempts to explain the problem of social structural factors at the household level to determine leadership positions and institutional factors in the CFUG institutions that determine benefit distribution particularly to the poor and underprivileged groups of the society. The study may also identify some issues in benefit distribution of common property for further study. The benefits of common property are valuable for the livelihoods of many people.

## 2.10 Conclusions about Resources and the Economic Setting

Land use, forest resources and the socio-economic situation of the nation vary in each ecological zone. In Nepal, forest covers about 4.27 million hectares (29%) and shrub covers 1.56 million hectares (10.6%); the total forest and shrub cover is 39.6% of a total land area of 14.72 million hectares (Master Plan for Forestry Sector, 1989). In Nepal in 2008, there were 16,840 CFUGs with 1,711,097 households in 74 out of 75 districts covering 1,217,172 hectares of forest land (A. Paudel & Weiss, 2011). Nepal largely has a subsistence economy.

Social structures and stratification are the hierarchical arrangement of a society. Lower castes and women form a disadvantaged group; men of higher castes have all the power. This makes participation of people in development activities and the sharing of benefits of development much harder for low castes and disadvantaged groups (Banjade, et al., 2004).

Humans and forests have always had a multifaceted relationship. Various forest policies and legislation to manage forests and solve the needs of local people have been produced. However, they are neither able to protect the existing forests nor place the forest under sound technical or active management. Nepal's forest cover has declined from 57% to 23% of the national area (Metz, 1991). The Master Plan for the Forestry Sector (MPFS) was officially implemented in 1989. The main attributes of the MPFS were to meet the basic needs for forest products by local people through CF, hand over accessible forests to users, and empower CFUGs to manage the forest resources. In contemporary CF, the CFUG is an institution that has an Executive Committee (EC).

The main problems of the leaders are the elite who favour decision-making attributes that are rooted in Nepalese social structure. They comprise the CFUG as a "grass roots" level institution to form a participatory democracy. All CFUG members meet once every two years to elect/select members of the EC who are responsible for CF products and the distribution of other benefits, implementation of the CF operational plan, managing the forest protection scheme, managing harvest operations, working with the line government and NGOs/CBO agencies' personnel when needed. The EC also has a responsibility to manage the expenditure for local development and be user friendly, particularly to the poor and underprivileged users of the CFUG. However, in practice, the elite and powerful people of the society can easily influence the decisions about benefit distribution by simply being selected for the EC of the CFUGs. Adhikari and Di Falco (2009), Agrawal (2001) and Sapkota and Oden (2008) claimed that there has not been equitable distribution of the benefits of forest products and other benefits from CF.

In contrast, where the NGOs have strengthened local communities at a grass roots level, particularly disadvantaged households, through motivation, training and workshops, poor and marginalised households have greater participation in the EC (Balooni, Lund, Kumar, & Inoue, 2010; Ojha, Cameron, & Kumar, 2009; Thoms, 2008). They argued that NGOs, using a multi-pronged approach that involves analysis and self-reflection about the capacity of the poor to voice their opinions and choices in decision-making, brings a fundamental change in a CFUG organisation. When the voice of the poor can be heard through membership on the EC and equal participation in decision-making processes, they are able to claim equitable benefits from CF (Adhikari, 2005; Naidu, 2009).

These factors underpin the focus of this thesis on the role of the poor in decision-making in CFUGs. The key factors that need to be studied are:

- Whether there are factors not related to the wealth or castes that increase the likelihood of being on the EC.
- What the effects are on the benefits flowing to the poor when the EC has the more disadvantaged members represented in decision-making.

In order to study these factors and to address the research hypotheses, an analytical framework that incorporates the relevant theories about the behaviour of decision-makers is required. This is covered in the next chapter.

# Chapter 3
# LITERATURE REVIEW AND ANALYTICAL FRAMEWORK

## 3.1 Introduction

As explained in the previous chapter, it is not well understood whether the social and institutional structure of CFUGs constrains decision-making and the distribution of benefits to poor and underprivileged households. This chapter endeavours to formulate a conceptual framework to examine the hypotheses described in Chapter 1.

Societies are composed of social groups including class, caste and ethnicity, with diverse religious, social and cultural attitudes, beliefs, identities and values that determine power relationships to access and control resources (Bistha, 1991). Social exclusions and discrimination depend on social structures, norms, values and leaders' behaviour. Social leaders play critical roles by exercising their power and influence in societal and institutional decision-making processes that might exclude certain groups from full participation in the society. The role of social and institutional decision-making processes leads to exclusion and the deprivation of poor and lower castes when the leaders of the elite with wealth, often linked to their caste; do not address the needs of poorer people. For example, Bennett (2005) found that *Janjati* and *Madhesi* presence in parliament in Nepal is limited and does not match their proportion in the population. *Dalit,* however, are almost entirely absent from parliament and have had only one representative during the multi-party period 1990 to 2005. Bennett (2005) further asserted that the domination by the elite caste (*Bahun, Chhetary)* has also increased in the civil service in Nepal from 70% to 90% between 1985 and 2002.

Over the last three decades, it has become understood that the social structure and its composition with class configurations are correlated with decision-making and benefit distribution from the CBNRM (Mansuri & Rao, 2004; Ostrom, 2007). Decision-making processes and benefit distribution can be analysed in various ways. Local CBNRM institutions carry out their functions through rules, regulations and working practices largely formulated by a small group of decision-makers who influence social organizations with regard to the distribution of the benefits of CBNRM (Adhikari & Di-Falco, 2009).

The elite have dominated decision-making in Nepal for centuries. The Community Forestry Programme in Nepal is based on people's participation (Master Plan for Forestry Sector, 1989). The main principle of the participatory approach was to involve the poor and underprivileged people in the decision-making process so that it could lead to proper benefit distribution from CF to those households (B. Bhattarai, Dhungana, & Kafle, 2007). The purpose of this research is to assess whether the poor and disadvantaged households have been able to participate in decision-making and whether this is linked to the benefits derived from CF. In other words, this study attempts to determine whether the CF programme has changed the traditional system of elite power.

Similarly, the Forestry Development Programme has also rapidly changed between the 1950s and 1970s to focus community development on poverty alleviation, largely in the context of social and economic development. However, currently, the community development strategy is also addressing the active participation of poor people in community development programmes for sustainable livelihood and poverty alleviation at the community level (Brocklesby & Fisher, 2003; Department for International Development, 2000, 2003; Food & Agriculture Organisation, 1980). Thus, it is important to understand what is meant by people's participation.

## 3.2 People's Participation

The concept of the participatory approach emerged towards the end of the 1980s with the notion of *Participatory Development* or *Participation in Development* (Oakley, 1995). Oakley (1995) advocated participation regarding rural development as follows:

> "Participation includes people's involvement suggested in the key stages in the participation processes, decision-making, implementation programmes and sharing in the benefits for the development programmes, and the involvement in efforts to evaluate such programmes" (, p.8).

The major development agencies, like the Food and Agriculture Organisation (FAO), World Bank, and United Nation Children's Fund (UNICEF) have "latched on" to the concept of *participatory development* and have begun to see it as an, "antidote to the woes which befall their development programmes" (Oakley, 1995, p.7). Participation is perceived as a key indicator of a socially healthy, engaged, and equal society (Perkins, Hughey, & Speer, 2002). In contemporary rural development, participation has provided an emphasis on the capacity building of rural people based on community-based initiatives and partnerships (Oakley,

1995). People's participation involves empowerment of the rural people for the contribution to and sharing of benefits from the development activities through local organisations such as forest user groups, co-operatives, farmers' associations, irrigation management committees, drinking water committees, and health committees (Oakley, 1991).

Collectively, these concepts emphasize a new paradigm of community participation to engage rural people, including the poor and underprivileged groups, in a dialogue about power, inequality and oppression. Priorities and actions are decided by local people themselves rather than outsiders, which empowers them for collective decision-making (Brocklesby & Fisher, 2003; Chambers, 1983).

Asian Development Bank (1999) explained that, over the last four decades, a series of bilateral projects and international NGOs have supported the Nepalese government with projects like the Koshi Hills Development Programme (KHDP) and its successor the Koshi Hills Area Rural Development Programme (KHARDEP). The UK Department for International Development (DFID) has supported the forest sector of Nepal since 1979 through different projects, including the Livelihood and Forestry Programme (LFP). Other bilateral projects such as the Sagarmatha Integrated Rural Development Programme (SIRDP), Rasua Nuwakot Integrated Rural Development Programme (RNRDIP), Rapti Integrated Rural Development Programmes (RIRDP), Karnali Bheri Integrated Rural Development Programme (K-BIRD), Integrated Hills Development Programme (IHDP), Seti and Mahakali Integrated Rural Development (S/MIRD), World Bank, Danish International Development Agency (DANIDA) and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) have been working for the inclusion of the poor and underprivileged groups of society as equal participants in decision-making and equitable access to forest resources (Amatya, 1989). Despite the introduction of the participatory approach four decades ago, its desired effect of involving the poor, women and disadvantaged groups of the CFUGs in the management of forest resources and the decision-making process has not been as expected.

### 3.2.1 Forestry Development Programmes Towards Sustainable Livelihoods and Poverty Alleviation

Forestry development programmes have also consciously been directed towards sustainable livelihood to alleviate poverty. Many studies have provided evidence on the roles of forests in rural livelihoods. The governments of developing countries have also recognised the livelihood needs of rural people with forestry development activities that focused on the

alleviation of poverty through CF, social forestry and joint forest management activities. Currently, projects related to the Reduced Emissions from Deforestation and Forest Degradation (REDD) and Payment for Environmental Services (PES) are important for developing programmes for sustainable livelihoods and poverty alleviation worldwide (Blom, Sunderland, & Murdiyarso, 2010). Similarly, in the Millennium Development Goals (MDGs) programme conducted by UNDP, attention has been more focused on the possible link between poverty alleviation and income from forest products (Yemiru, Roos, Campbell, & Bohlin, 2010). The main policy document in Nepal, the MPFS 1989, is guided by the participatory approach. It is a commitment by the Nepalese government to ensure the participation of poor people in decisions. The government has also formulated various laws such as the Forest Act 1993 and Forest Regulations 1995, and given several government directives towards the implementation of forest management activities through the full participation of local communities.

A CFUG serves as a local organisation for community forest management. It has been designed to make equal participation of people from all sectors of a stratified society in decision-making for the distribution of the benefits derived from CF (Adhikari & Di-Falco, 2009; Dayton-Johnson & Bardhan, 2002; Malla, et al., 2005). However, in practice, it is believed that collective action is exercised by the wealthy and caste elite leaders of the CFUG rather than all members. The CFUG organisations are formed with certain rules, regulations and norms, however, the way these are put into practice might have been influenced by the elite. They usually dominate positions and exercise their power and influence on decisions. In order to understand how the elite behave and manage institutions it is useful to look at models of elites and how they are correlated with institutions like CFUGs.

## 3.3 Models of Elite Behaviour

Vilfredo Pareto and Gaetano Mosca, Italian political scientists and sociologists, are well known as pioneer spokesmen for elite theory (Malesevic, 2010). Both recognized that, in the history of modern society, there is a perpetual domination of the disorganised large group by an organised small group. Small group domination of the large group in society is known as *elite orientated social stratification* (Bottomore, 1964; Coleman, 2001). The different ranking of humans is a fundamental phenomenon of the social system. Coleman (1986) further explained that elite theory makes a possible connection about how social systems might be shaped by human will as:

> "The functioning of the society as well as the engine of social change could be grounded in the purposive actions of the individual, taken in the particular institutional and structure setting that shaped the incentive and thus the actions" (Coleman, 1986, p.1310).

Higley (2010) claimed that the origin of elite theory was seen most clearly in the writing of social and political philosophers of the 18th and 19th centuries, such as Gaetano Mosca (1858-1941), Vilfredo Pareto (1848-1923), Robert Michels (1876-1936) and Max Weber (1864-1920). Mosca (1939) highlighted the ways in which small minorities out-organise and outsmart large majorities. Higley (2010) explained that the political elite "usually have a certain material, intellectual, or even moral superiority" ( p.161). Pareto suggested that there is an unrestricted social mobility in a society whereby the elite would consist of the most talented and deserving individuals (Higley & Burton, 2006).

Though individual behaviour (cognition) is fairly well understood, group or cooperative behaviour (social/cultural) is an active area of research in order to find solutions to the benefit distribution problems of public goods (Giddens, 1976; Ostrom, 1999; Ostrom & Ahn, 2003). The theories of society and human social action include social rules and processes and how these rules and processes develop and organise people in society (Bruins, 1999; Coleman, 2001; Vromen & Collin, 2010). The functions of institutions are supposed to be strongly related to the welfare of society (Ostrom, et al., 1994; Putnam, Leonardi, & Nanetti, 2005; Sztompka, 1994).

Elite theory is used to examine how power relationships are composed, how the exclusion of non-elite social groups from decision-making positions occurs and the way in which elite groups' influence is exercised (Chandler, 2007; Farazmand, 1999). Scholars have developed various definitions of elite on the basis of function and background. Some pertinent definitions of the elite are discussed below.

**Elite** is from the Latin *eligere*, "to elect" (Korvenoja, 1993). The concept of elite was developed by Mosca (1896) who introduced the term *classe dirigente* or ruling class to describe the power of the ruling minority (Scott, 2008).

The elite are represented by a small group of individuals from society at large (Brannelly, Lewis, & Ndaruhutse, 2011; Dahl, 1957, 1958; Farazmand, 1999; Higley, 2010; Mills, 1956; Mosca, 1896, 1939; Pareto, 1935, 1968, 1973, 1991; Porter, 1955; Putnam, 1971, 1976) . The

dimensions of their decisions are based on their interests and preferences and they influence decisions that affect outcomes. It means that a class of a few people rule a more numerous class of people who are ruled, directed and controlled by the few.

The elite concept can be applied to the context of this research, since caste and wealth are inherent characteristics of the elite in Nepalese society. The *Bahun*, *Chhetry*, *Newar* and *Thakuri* are identified as the elite who comprise 25% of the population and dominate the rest of the population (Lawoti, 2003; K. K. Shrestha, 2009; Toffin, 2008). They manipulate the societal apparatus including policies, the constitution and social values, and control resources (Bistha, 1991; Lawoti, 2003). In the next section, the role of the caste elite linked to wealth and the wealthy elite created social structure institutions are reviewed.

## 3.4 Caste and Wealth as an Elite in Nepal

One of influencing social institutions is the caste system, which is common, particularly in South Asia including Nepal and India. The word "caste" is derived from the Portuguese term 'casta' which means breed or race (Bistha, 1991). It is a group of people characterised by endogamy, hereditary membership and a specific style of life and is usually associated with ritual status in hierarchical systems based on purity and pollution (Dirks, 2001). According to Hindu spiritualism, the caste system is classified into four main *Varna,* i.e. groups of people; *Brahmins*[6] (primarily priests); *Kshataryias*[7] (warriors)*; Vaishias*[8] (businessmen) and *Shudras*[9] (lower caste artisans and manual labourers). The untouchable people lie outside this caste system; they cannot perform ritual activities because they are considered impure (polluted). According to Dirks (2001), the division stands beyond Hinduism. Though the caste system gives a connotation of a hierarchy of a 'ritual and pollution' status, in reality it was an ethnicity-based division of hierarchical roles in society. Hence, the caste system has an important role in India and Nepal in terms of the exact nature of each caste and its relationship to the others. A person's caste status impacts on his/her activities in variety of fields. For example, Stuart (2007) found that only two of 27 presidents in India were of lower caste; hence the lower caste is under represented at the leadership level. Bennett (2005) found

6. "Scholarly community," includes the gurus, priests, scholars, teachers, law specialists, ministers, and diplomats.
7. Kshatriyas - "high and lower nobility" includes kings, noblemen, soldiers, and administrators.
8. Vaishyas - "mercantile and artisan community" includes merchants, shopkeepers, businessmen and farm owners.
9. Shudras - "service-providing community" those who provided other services to 9 Shudras - "service-providing community" those who provided other services to society including, but certainly not limited to, manual labour.

Source: Dirks (2001).

that, during 1990-2005, there was only one member in the Nepalese parliament from *Dalit*. Wealth and social power made a difference in capacity between castes to participate in and influence social the decision-making processes.

There are some conflicts in policy principles and social practices. On the one hand, Nepal stresses multicultural and diverse ethnicity, but, on the other hand, there is societal conflict between the higher castes (*Brahmin, Kshatriya, Newar* and *Thakuri*) and the lower castes (*Dalit:* untouchable). Similarly, there is also conflict and spiritual and domestic injustice between Hindu and Buddhist, Hindu and Muslim, and the *Pahadiya* (hill people), and *Madheshi* (plains people).

The caste system has forced many ethnic groups (e.g. *Dalit, Janjati and Madhesi)* into lower social status and poverty (A. Shrestha, 2002). The *Dalit* and lower castes are basically shunned from society (Rao, 2010). For example, *Dalits* find it very difficult to get a public job, and, if somehow they get one, they are forbidden from holding the job because an untouchable caste is a person with basically no rights (Rao, 2010). Another rule within the caste system is that Brahmins are not supposed to marry outside their caste. This notion may be one of the factors that maintain poverty in Nepalese society. The main reason could be that Nepalese society is structured to keep this tradition going. Rao (2010) explained that the inability to marry a person from the untouchable caste further traps those people within their poverty. Furthermore, due to the caste system, *Dalit* and several lower castes such as blacksmith, goldsmith, tailors, shoemakers, fishers and cleaners are assigned to low income jobs. Often in Nepalese society under the *Halia Pratha* (landlord system) lower castes and the poor are forced to work as servants for their landlord (Nepali & Subba, 2005).

There are many other reasons why *Dalit* and lower castes in Nepal are trapped in poverty. For example, due to a lack of sufficient education, very few teachers belong to the *Dalit* and lower castes. *Dalit* children often find it difficult to gain a good education. In some communities, teachers who belong to higher castes (*Brahmin, Chhetri, Newar*, and *Thakuri*) do not pay attention to their *Dalit* and lower caste pupils. For example, *Dalit* pupils are not allowed to sit next to a higher caste pupil in their class (A. Shrestha, 2002). Rao (2010) explained that when *Dalit* pupils are interested in buying food at school they have to stand in separate queues. The same sort of separation occurs in other social development activities for the *Dalit* and lower caste households in Nepal. Rao (2010) also found that when good officials try to address the requirements of the *Dalit* then they are often insulted by their colleagues and seniors. The

effects of the caste system in social development programmes are slowly being exterminated, but changes are still met with a rigid stance in many parts of the country.

Most citizens from the underprivileged socio-cultural groups are excluded from almost all the significant realms of society in Nepal (Lawoti, 2001, 2003; Nepali & Subba, 2005). Table 3.1 shows the exclusion of the *Madhesi*, an indigenous people, and the *Dalit* from all influential realms of policy and institutions (parliament, judiciary, cabinet, constitutional commissions, administration, security, media, human rights and business and industry sectors).

For example, the caste Hill Hindu Elite (CHHE) representation was 30.89% in the 2001 census but, on average, they occupied two thirds of the different elite positions, which represents more than double their proportion of the population. In the top positions of the public service, judiciary, security forces, education and leadership, over 75% are dominated by CHHE. Non-elite groups face exclusion in every influential sphere. On average, indigenous people (Mangol, *Kirat: Rai, Limbu, Sherpa*) represent 7.1% of positions in Nepalese institutions (population share 22.2%) and *Madhesi* represent 11.2% (population share 30.9%). The *Dalit* were not even represented at the 1% level although they are 8.7% of the population. The *Dalit* are less than 2% of the Upper House. Likewise, not a single position is occupied by *Dalit* in the public service, constitutional commission and the science and technology sector of Nepalese institutions.

In summary, it can be seen that social structure in Nepalese society plays a crucial role in gaining power. The elite caste and wealthier households are able to influence decisions, access public resources and capture influential institutions such as parliament, the judiciary, cabinet, constitutional commissions, administration, security, media, human rights, and business and industry sectors. The disadvantaged and poor groups are generally excluded from significant realms of institutions, policies, norms and systems. In order to understand how elite power structures form, the effect this might have on CFUG governance and whether there are opportunities for non-traditional elite or leadership roles to emerge that might help the poor and disadvantaged, it is important to look at the theories of elite. This includes models of elite and how those models explain the role of poor and disadvantages members to receive greater benefits from public goods.

Table 3.1 Integrated national index of governance: the representation of vaarious castes in inluential positions in Nepal

| Institutions | CHHE | | Dalit | | Madhesi | | Newar | | Indigenous | | Other | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % | Number | % | Number | % | |
| Judiciary, Supreme, Appellate, District | 181 | 77.0 | 0 | 0.0 | 18 | 7.7 | 32 | 13.6 | 4 | 1.7 | | | 235 |
| Constitutional Commissions | 14 | 56.0 | 0 | 0.0 | 3 | 12.0 | 6 | 24 | 2 | 8 | | | 25 |
| Cabinet | 20 | 62.5 | 0 | 0.0 | 5 | 15.6 | 3 | 9.4 | 4 | 12.5 | | | 32 |
| Parliament lower and upper | 159 | 60.0 | 4 | 1.5 | 46 | 17.4 | 20 | 7.6 | 36 | 13.6 | | | 265 |
| Public service and Security force elite | 190 | 77.6 | 0 | 0.0 | 9 | 3.7 | 43 | 17.6 | 3 | 1.2 | | | 245 |
| Central committee of National Party | 97 | 58.8 | 0 | 0.0 | 26 | 17.8 | 18 | 10.9 | 25 | 15.2 | | | 165 |
| DDC Chair/Vice, Mayor, Deputy | 106 | 55.5 | 0 | 0.0 | 31 | 16.2 | 30 | 15.7 | 23 | 12 | | | 191 |
| Industry commerce leadership | 7 | 16.7 | 0 | 0.0 | 15 | 35.7 | 20 | 47.6 | 0 | 0 | | | 42 |
| Educational leadership | 75 | 77.3 | 1 | 0.0 | 7 | 7.2 | 11 | 11.3 | 2 | 2.1 | 1 | 1 | 97 |
| Cultural ;leadership | 85 | 69.1 | 0 | 0.0 | 0 | 0.0 | 22 | 17.9 | 6 | 4.9 | | | 123 |
| Science /Technology Leadership | 36 | 58.0 | 0 | 0.0 | 6 | 9.7 | 18 | 29 | 2 | 3.2 | | | 62 |
| Civil Society Leadership | 41 | 75.9 | 0 | 0.0 | 4 | 7.4 | 8 | 14.8 | 1 | 1.9 | | | 54 |
| Total | 1,011 | 66.5 | 5 | 0.3 | 170 | 11.2 | 231 | 15.2 | 108 | 7.1 | 1 | 0 | 1,5 |
| percentage (a) | | 66.5 | | 0.3 | | 11.2 | | 15.2 | | 7.1 | | 0 | 100 |
| Population percent (b) | | 31.6 | | 8.7 | | 30.9 | | 5.6 | | 22.2 | | 0 | 100 |
| Difference percent (a-b) | | + 34.9 | | -8.4 | | 19.7 | | 9.6 | | -15.1 | | -1 | |
| Domination ratio (a/b) | | 2.1 | | 0.03 | | 0.3 | | 2.7 | | 0.3 | | | |

DDC= District Development Committee. %=Percent

Source: (Lawoti, 2003)

## 3.5 Models of Elite

Sociology scholars have provided different visions about the behaviour of elite and their roles in an organisation. Due to various socio-economic, religious, ethnic, symbolic and political cultures, people's behaviour, ideas, interests and preferences have been presented differently in the institutions established by society. One phenomenon that is common in all societies is the emergence of economic and social elite. In order to study the behaviour and effect of elite, theorists have developed a varied set of elite models that relate the notions, behaviour and decision-making power of individuals.

Theorists about the elite start from a common definition: the elite are a powerful group of people who either outline or persuade decisions that influence the groups and national outcomes (Farazmand, 1999). These scholars have produced various definitions of elite for formulating and developing conceptual frameworks to examine and interpret elite behaviour. Power is an important attribute of all areas of society and institutions in modern societies that are correlated in one or another type with elite models. One of the earliest models of the elite was the political elite model devised by Guttsmann (1951). The political elite is a small group of people who influence state power through politics (Higley, 2010). Examples of political elite of modern states are the president, prime minister, ministers, state governors, and heads of government structures, regions, territories, diplomatic groups and organisations.

Higley and Moore (1981), building on the earlier work on the political elite by Guttsmann (1951), and subsequent work by Main (1961) and Whitt (1979), divided the political elite model into four models of the elite - consensually integrated, plural, power and ruling. These models are mainly based on two dimensions. The first is the inclusiveness of personal interaction among the top position holders and major elite groups. The second is the structure of the interaction contacts between these individuals and groups. Working from the four elite models identified by Higley and Moore (1981), Farazmand (1999) developed a fifth 'organisational elite model'. In this model, the elite develop through organisations that provide power and control. The models are summarised in Table 3.2.

Table 3.2 Summary of the features of elite models

| Circumstances | Consensually Integrated | Plural | Power | Ruling Class | Organisational |
|---|---|---|---|---|---|
| **Type of network** | Comprehensive interaction network of formal and informal communication with all formal organisational top-level position holders. | Simple interaction network among top level of elite policy makers as well as common people | Simple interaction network is small and among the uppermost national level elites only | Simple interaction with small group of central level present in most significant decisions | Comprehensive interaction network depending upon the characteristics and unit of organisation. |
| **Size of group** | Group relatively small and clearly centralised. | Larger groups based on different decision locations. | Small group centrally located. | Small group both policy makers and implementers | Small or large group depending upon the nature and entities of organisation. |
| **Frequency of interaction** | Frequent level of interaction | Less frequent level of interaction | Frequent level of interaction. | Less frequent level of interaction | Frequent level of interaction |
| **Type of interaction** | Cooperation and negotiation to form new elite, originate through dramatic and sudden changes in situation and attitude of the key group | Formal cooperation for policy making | Cooperation between uppermost level elite and operational level elite for implementation the directions of former one | Cooperation between apex level of elite and second stratum elite for translation of policy. However, conflict occurs if contradict in ideology. | Close cooperation between uppermost level elite and the operational elite. However, sometimes conflicts occurs to maintain elite cohesion by building consensus |
| **Characteristics of elites** | Complex family background, heredity power structural group united by ideology | Different social, economic, cultural, symbolic and linguistic family background such as hereditary, hierarchy and endogamy. They join with one another to form organisations or groups for their common interests. | Different family background that comes from biased mobilisation of social structure privileged for leadership through interclass marriage | Family back ground is hegemony of political, social and symbolic sphere, patrimonial, and traditional elite | Family background is radically different for people involved in apex level and local level organisation working for rural development such as forestry, drinking water schemes, health, irrigation and similar organisational context. However, local organisations are directed, controlled and dominated by the few local elite. |

In the context of CF, a CFUG is subject to the influence of the elite who can exercise their power and dominate the organisation. In Nepal, the poor and disadvantaged members may find it difficult to challenge the decisions made by the elite because they depend heavily for their labour on farms owned by the elite (Kumar, 2002). There is also evidence that the CF rules made by elite weigh against the poor and disadvantaged members of the CFUG (Kumar, 2002; Malla, et al., 2005). The models of elite behaviour and organisation thus have the potential to describe the role of the elite in CFUGs in Nepal. Each of the elite models will be discussed in detail and their application to the context of CFUG organisation in Nepal examined.

### 3.5.1 Consensually Integrated Elite Model

In the consensually integrated elite model, the elite comprise a comparatively small and noticeably centralised group in society. The decision-making powers are dispersed among various elite or, sometimes, the elite mutually access the power centres to influence decision-making and achieve their objectives. There is a comprehensive interaction network with frequent formal and informal communication between the position holders and members. They come from a multifaceted family background, hereditary power structure group, and they are united by a similar ideology, attitudes and objectives that provide them opportunity for moving towards to close cooperation and negotiation to form new elite.

In the consensually integrated elite model, the elite are characterised by being a comparatively small and centralised group, and who show situation-specific behaviour. In this model, the elite are assumed to share a largely implicit consensus about the rules and codes of political conduct, which gives them a reserved membership. Hazán (2001) found that the elite are interconnected by ideology. Higley and Moore (1981) and Cammack (1990) found that in consensually integrated elite model, power is dispersed among numerous elite groups. The elite have mutual access to power centres that account for controlled competition for power that leads to stability (Burton & Higley, 1987).

An interaction network is a powerful set of tools or ways of describing and flowing messages about the characteristics of individuals and collective actors (Emirbayer & Goodwin, 1994). Higley and Moore (1981) defined the consensually integrated elite model as that where “there is an inclusive network of formal and informal communication, friendship, and influence-wielding among top position holders in all major elite groups (i.e. business, trade union,

political, governmental, mass media, voluntary association and academic elite)" (p.584). In the interaction network, there is a set of inherent assumptions about important issues including the micro and macro relationships between individuals, society and social activities (Higley, Hoffmann-Lange, Kadushin, & Moore, 1991). In the consensually integrated elite model, the interaction network is the ground where the related elite leaders, politicians, organisational chiefs and subordinates raise and produce their agendas for interaction in relation to the control and maintenance of power elite positions.

The members of the elite group are integrated after a long process of frequent interaction among their members and come to conclusions by consensus for unification and settlement. The personal interactions and the consensus on values are the main attributes that are positively correlated for integration and to the fraction of the national, sector and local level elite. Elites are strongly integrated through a dense overlapping network that provides them satisfaction about access to most central decision makers (Hazán, 2001).

Higley and Moore (1981) indicated that the consensually integrated elite model is suitable where the integration of the elite has occurred after a long process of fragmentation. The consensual elite model is suitable where there is a central social circle because the members of these circles influence policy formulation through interaction within the social circle. In both central social circles and national political subculture a unique subculture develops where the core subgroup can unify and interrelate.

The consensual elite generally create a stable representative regime in which the elite compete for power in a representative body through elections. Cooperation and negotiation are the factors that integrate the consensually elite to form a new elite to resolve issues and to avoid conflict. Henderson (2010) found that indigenous variables, particularly family background, heredity, and the power structure of the reputable family in the society, were important in the formation of the consensual elite. Duffy, Binder and Skrentny (2010) stated that social movements and social change might be important factors for the emergence of the elite.

The consensual leader believes his working pattern, ability, education and plan provides services to the citizens (Cammack, 1990). When the regimes are conducted in such a way that power is concentrated in the hands of one group or family and where opponents are suppressed, it leads to fragmentation of the consensually elite because the power located in a

representative body is transferred between factions through elections (Steen, 2002). Additionally, the polarisation of the consensual elite depends on infrequent interactions across factional or sector boundaries. Higley and Moore (1981) argued that separation of the consensual elite occurs if they are institutionally distinct, socially disparate or politically diverse. Separation can also be along religious lines and possibly geographical location (Fiorina & Abrams, 2008).

In summary, in the consensually integrated elite model, powers are dispersed among the various elite. The elite have mutual access to power centres that account for controlled power competition to achieve their objectives. Cooperation and negotiation are the factors that integrate the consensually elite to form a new elite to resolve issues and to avoid conflicts. In this model, the elite comprise a comparatively small and centralised group in society. The separation of the consensual elite occurs if they are institutionally distinct, socially disparate, politically diverse or religiously split. In context of CF management, the consensually integrated elite model may be relevant because there are different elite groups in terms of wealth, outside employment or income, but who would otherwise have the same basic norms and beliefs as members of the same caste.

### 3.5.2 Plural Elite Model

The plural elite model assumes that many groups control the power structure. They come from different economic, social, cultural, symbolic and linguistic family backgrounds such as hereditary, hierarchy and endogamy (Anderson, Anderson, Friedrich, & Kim, 2010). The interaction network is also not centralized to one specific group. When individuals are capable of expressing their interests, they join with one another to form organisations or groups for their common interest. They may have different modes of thought, integrated with different concepts of the relations between individuals and the community since they reside on different locations.

The plural elite model suggests both a convergence and differentiation of powers between members of the elite. Convergence is the tendency of elite to grow more alike in structures, processes and performance. The differentiation refers to the fact that the elite diverge from each other in terms of policies, processes and performance for their own interests (Giddens, 1972; Parkin, 1972). The plural elite model helps to develop models of social systems characterised by hierarchical or oligarchical structures. There are two main ways that the plural elite situation is formed: one is in the context of traditional elite and the other in the

context of a new elite. The traditional plural elite are formed by the coexistence of distinguishing ethnic, religious, linguistic and cultural differences between members of the elite (Stock, 2008). The traditional elite is the person, born in the upper class, who inherits the gifts of privileged culture and capital (the person can attend private school and operas) that enable him/her to reproduce the elite culture and specific status in society (Ahmad, 2010).

The new elite are those who may have earned economic, social and culture capital but who does not have symbolic capital. Symbolic capital is an accumulation of economic capital that can be converted from one elite to another elite, ultimately in order to gain advantage in the form of additional wealth, power, allies and marriage partners (Bird & Smith, 2005). Symbolic capital can be referred to as the resources available to an individual on the basis of prestige or recognition. The new elite can gain such symbolic capital through performance in society.

Like the consensually elite model, in this model the leaders of all the sectors, organisations and interest groups present themselves in interaction networks. The main attributes and promise of this model are that members represent the policy-making authorities from different decision locations and no single group of elite dominates the structure (Farazmand, 1999; Higley & Moore, 1981). The interaction among the plural elite group is not consciously centralised in an "inner circle" or "core" group. The interaction between intrasector and intersector elite is considerably less frequent and is based on specific issues. The intrasector elite are located in different decision centres at the regional level whereas intersector elite are prominent leaders who participate in the interaction network at the core or central circle. The intrasector elite interaction is greater than the intersector interaction because of the sector autonomy; intersector interactions occur only in the government political elite.

Farazmand (1999) and Higley and Moore (1981) referred to the plural elite model in which a privileged minority, a small group of elite people who have more power, social standing, wealth or talent than others in the society and, whether they have a distinct ethnic, religion, linguistic and culture, they put their decisions into effect through different decision centres and not just a central one. Collectively, the elite who present an interaction network at different decision locations connect with each other for their impact behaviours joined by common interests (Etzioni-Halevy, 2003). Kreps (2010) argued that the plural elite connection and consensus have limited the impact of their public beliefs because of less frequent linkage with their regional leaders.

The plural elite model is based on the premise that there is not a single elite group dominating power. The plural elite are not centralised in an inner circle or with core groups. Each group has different modes of thought that integrate them by different conceptions of the relations between individuals and the community (Breton, 1978). The interaction networks are located at different decision centres for debating related issues. The plural elite work together when required on behalf of all other elite groups for their mutual interest.

In the Nepalese social context, Nepal is considered to be a typical plural society including cultural diversity of religions, castes, languages and ethnic groups, regionally categorised into different indigenous people. Presently, 101 ethnic caste groups and subgroups and 93 living languages with eight religions (Hindu, Buddhist, Islam, Kirat, Jain, Sikh, Christian and Bahai) have been recognized (H. P. Bhattarai, 2004). The plural society stresses the relationships among race, ethnicity, language, religion and culture, but these differences are socially, culturally, politically and historically structured in the process of interaction (D. L. Shrestha, 2004). The plural nature of Nepalese society means that the plural elite model may also explain the behaviour of those who manage CFUGs, since it is able to capture the interaction of groups who come together only for issues of mutual interest, but who otherwise work and live separately.

### 3.5.3 Power Elite Model

As can be seen in Table 3.2, the power elite model is based on a clear hierarchy of power and influences that exist among uppermost elite groups. The idea of the power elite model begins with the concept that power is exercised by a relatively small group of powerful people who use their power to dominate policy-making (Domhoff, 2009). The interaction network for the power elite model is small and concentrated, with frequent contact between the elite (Lukes, 1974; Ruostetsaari, 2006). Power elites emerge through the exercise of power.

Power is the kind of social ability of an individual that provides confidence to the person to control outcomes. Scholars have defined power in various ways depending on the situation, perspectives and objectives. Weber (1978) defined power as actual influence over others. Lammers, Stoker and Stapel (2010) said that power is an influential term and "because powerful individuals who possess more social and financial resources than they require, they are relatively free to do as they please" (p. 545). Maclean, Harvey and Chia (2010) claimed that "in its most generic sense, power is a causal force that produces external effects and

consequences" (p.328). The term power elite refer to a group of people who have a tendency to dominate policy making through exercising their individual power. This includes bureaucratic, corporate, intellectual and governmental elite who can control the principal institutions and whose opinions and actions influence the decisions of policy makers. Power is formed by the ability of the actors who have to facilitate several processes (Barnett & Duvall, 2005; Brian, 2008). The formation of power is always involved in competition, and the winners mostly exercise the power and losers are struggling to achieve it.

The interaction network of the power elite model is "not as inclusive of all major elite groups as the consensually integrated and plural elite models" (Higley & Moore, 1981, p.584). The interaction network for the power elite model is small and concentrated frequently only among the uppermost layer of the elite. The interactions in the power elite model are informal in that power is clearly hierarchical and influence exists among the elite group. Farazmand (1999) and Higley and Moore (1981) stated that at the apex of the hierarchical power in the power elite are structures such as business and, perhaps, political elite groups. Mills (1956) asserted that, in the beginning, the power elite and their unity rested on coincidence of interests for the business, economic and political activities. Weston (2010) argued that the power elite are centralised and coherent in their view of power.

The connections of the power elite exist at two levels. The first level is at the core and uppermost level. The second level is the operational power elite who act as implementers of the decisions taken by the former. Lindsay (2008) asserted that the connections of power elite are based on the interests/needs of those who occupy commanding power in society. The separation of the power elite varies according to the situation. Some power elite are more autonomous than others. The factors that generally play a vital role in separating the power elite are the type of political system, kinds of economic systems, the bureaucratic structure of society and the level of development (Arslan, 2006). Business elite, military elite and political elite, in particular, have greater autonomy from each other.

In summary, the power elite comprise a relatively small well-knit group of people who act at a central level. The interaction network of the power elite model is narrow and frequently concentrated among only the uppermost layer of the elite. In the context of Nepal, there are powerful informal networks where the power elite interact with their own hierarchical powerful leaders and government elite who belong to the caste and wealth elite (Parajulee, 2010). Lachapelle et al. (2004) found a similar power set-up in the context of CFUGs. Power

is based on past debts, usury (money lending) and kinship. The power elite model may have relevance to behaviour in CFUGs; however, it appears to be most relevant to regional and national levels of interaction.

### 3.5.4 Ruling Class Elite Model

In the ruling class elite model, the elite comprise the apex hierarchy and are controlled by some of the political ruling class. The ruling elite are recruited from a small group of people with specific family backgrounds including patrimonial, traditional and symbolic spheres of the society (Adams, 1994). The general concept of the ruling class elite model is that society is stratified with the masses of common people at the bottom and the ruling class elite at the top (Cock, 2010; Dahl, 1958; Higley, 1984; Higley, 2010; Higley & Moore, 1981; Mills, 1956). The elite belonging to this ruling class are rich and well educated, share beliefs and use their influence to dictate top level public policies particularly in political issues. They delegate less powerful positions to the secondary elite group of people (operational decision makers) whose functions include the transformation of policy preferences and the adoption of policy choices that do not deny of the choices of the apex level policy makers of the ruling class (Farazmand, 1999; Woods, 1998). The interaction network is designed for less frequent interaction at the uppermost level predominantly of a triumvirate (three powerful economic, political and military groups) that is administrative in nature.

The ruling class is a social formation based on heritage and social ties (Domhoff, 1975). The apex of the hierarchy of the ruling class model is occupied by the business class and some political ruling classes. Hence, both the ruling class and power elite models are roughly the same in configuration. The significant differences between the ruling class model and power elite model arise at the "level of interpretation rather than of description" (Higley & Moore, 1981, p.585).

The main feature of this model is that the ruling class elite, who explicitly represent the uppermost layer, are present in most significant decisions (Farazmand, 1999). The numbers of people who exist in this circle is very small and perform top level decisions. They delegate less powerful positions to the secondary elite (implementers and operational decision makers) (Farazmand, 1999). Dahl (1958) and Higley (1984) argued that ruling elite require not only control of important resources and networks but also the achievement of unity and cohesiveness among the members.

Cock (2010) explored how the ruling class elite have managed to endure in the context of minor political and economic changes that might have been expected to undermine the basis of its power. The key factors were the patrimonial attributes of the state, the interlocking between state leaders, the emergence of the ruling elite class and sometimes external forces such as foreign aid groups and agencies that contributed to the promotion of policy. For example, Housden (2010) showed that Nepal is still primarily patrimonial where power in Kathmandu remains locked within a tiny circle of ruling elite.

The ruling elite is formed by the preferences of a small powerful group that regularly interrelates for key political issues, particularly most significant decisions (Dahl, 1958; Farazmand, 1999; Mills, 1956; Myhre, 2008; Rock, 2010). Ruling class cooperation with other sectors in order to broaden their privilege structure is rare. The monopolization of power by the ruling elite for themselves is the main factor that separates them from the non-elite and other parties (Higley, 2010; Zetterberg, 2003).

The main characteristic of the ruling class elite model is that the ruling class elite is a small group that represents the uppermost layer of society and power, and that participates at the top level in most significant decisions. In the context of CFUGs in Nepal, the ruling class elite model is not really relevant because the Nepalese ruling elite represents a small number of elite castes and wealthier groups that function at a national level. It could be argued that the caste system presents opportunities for the ruling class elite model to be present in the form of hereditary rights to privilege in a community based on family and caste; however, this is not directly linked to political or economic power.

### 3.5.5 Organisational Elite Model

Organisations are social entities that are directed by definite goals, structure and coordination systems that link to the external environment (Daft & Lengel, 1986; Tsang, 1997). In the context of pluralism, an organization is a society where diversified social groups, including racial, religious, ethnic and cultural, reside together in the same society (Alder, 1983). An organisation is also a framework within which actors can pursue their self-interest (Farazmand, 1994) . The interests of people are socially constructed on the basis of societal norms and values rather than derived naturally (Lewis, et al., 2003). Organisations define what these interests are, how they are acquired, and how they are internalized by the individual (Jentoft, 1997; McCay & Jentoft, 1998).

Farazmand (1999) developed the organisational elite model because, "plural, power, ruling and consensually integrated elite operate organisationally in an organisational context" (p.335). The organisational elite model is based on the notion that organisations are directed, controlled and dominated by a small number of people who influence the overall goals of the organisation (Farazmand, 1999).

The central assumption of this model is that individuals can create and exercise power through institutional mechanisms. Higley, Burton and Field (1990) and Farazmand (1999) explained that the organisational elite have control over the organisation and that gives them power to influence the organisation, both implicitly and explicitly. Consequently, the main underlying assumptions of the organisational elite model are that the ideals and interests of the elite affect the entire organisation and its members as well as the goals and direction of the organisation.

Each organisation is formed by people, but only few people control and dominate the organisation once it is created. The organisational elite are formed from the evolution of social, economic and bureaucratic organisations (Heydebrand, 1977; Weber, 1947). As organisations do not emerge in a vacuum, they have roots in the social and economic life of the society (Kukolev, 1997). Hence, the formation of the organisational elite is associated with all strata of society. The interaction level is frequent or complex depending on whether it is small or large, private or public, national or international level organisation.

Organisational performance is directly related to the elite's values and influences that impact on behaviour and actual accomplishments of the organisation (Hage 1965). Organisations have developed various profiles of collaboration, combinations of experience, skills, knowledge, access and status (Moore, 2006). Ruostetsaari (2006) stated that the organisational elite model interaction networks can be considered as devices endorsing and reinforcing attitudinal cohesion through courses of action by social leaders. Farazmand (1999) asserted that organisational connections and control are achieved through a multitude of elite managerial, supervisory and structural mechanisms (Haas, 1993; Hage 1965). The organisational elite are connected by virtue of processes such as administrative accountability, budgetary processes, and the process of administrative actions.

In summary, in an organisational elite model the key points are that the CFUG is created by government mandate, the organisation has power, its executive forms the elite in the community and those who fill positions in turn attain a form of elite power. This makes it relevant to CFUGs because the poor have an opportunity to participate as elite if they can get executive positions in the CFUG.

## 3.6 Conclusions from the Review of Elite Models

The previous sections have reviewed the elite models proposed by Higley and Moore (1981) and Farazmand (1999). These models provide a basis to shape a conceptual framework for this study. As was discussed earlier, the key characteristics of the elite in small, subsistence farming communities in Nepal are linked to wealth and caste. In this context, the models that best characterise the elite in CFUGs are the plural, consensual and organisational elite models. The power and ruling class elite models are less relevant to these communities.

The consensually integrated elite model is likely to fit the context of a CFUG where the executive is composed of individuals who are wealthy and of the same caste. In this case, common caste and economic status mean that the EC members are more likely to interact outside the CFUG context and, when they do meet for CFUG business, they are more likely to reach consensus on decisions due to their common beliefs.

The plural elite model is also likely to fit the context of a CFUG where the executive is composed of individuals who are wealthy and of different castes. In this case, the difference in caste is going to mean that the EC members are unlikely to interact outside the CFUG context and, when they do meet for CFUG business, there will be a greater difference or plurality in objectives due to differences in beliefs created by caste. However, a common wealth status means the executive is more likely to agree on CFUG decisions.

The organisational elite model fits a situation where power is created by the organisation, rather than by the wealth or caste status of the individual. In this sense, an individual becomes part of the elite by becoming part of the EC. The key for the poor and disadvantaged is how they gain a position on the EC. One way that this can happen is when individuals gain experience and training in leadership through NGOs or CBOs. This experience provides direct skills that are important to CFUG management, making these individuals valuable members of committees, as well as providing confidence to individuals to make themselves available for leadership in a CFUG. Examples of local NGO/CBOS in Nepal include PAF

(Poverty Alienation Fund), RWSS (Rural Water Supply and Sanitation), MEDEP (Micro Enterprises Development Programme), LISP (Local Initiative Support Programme), RUPP (Rural Urban Partnership Programme), PASRAP (Poverty Alleviation in Selected Rural Areas of Nepal) PRMCIP-MS (Nepal Marginalised Community Empowerment Project), PVSE (Poor, Vulnerable and Socially Excluded), RWUDUC (Rural Women Development Centre), SAGUN (Strengthened Actions for Governance in Utilization of Natural resources), DLGDP (Decentralised Local Government Development Programme), DANIDA (Danish International Development Agency, DNGOF (Dalit NGO Federation), FECOFUN (Federation of Forest User Group, Nepal), NGOFN (NGO Federation of Nepal), CTVET (Centre for Vocational and Educational Training), DLGSP (Decentralised Local Government Support Programme), NSCFP (Nepal Swiss Community Forestry Project), and LFP (Livelihood and Forestry Programme). These organisations may have a key role in enhancing the capacity of poor and lower castes through the implementation of specific activities such as training, workshops, study tours and so on, that help them to participate in decision-making and strengthen their capacity (Jha, Prasai, Hobley, & Bennett, 2009). These initiatives make the poor able to work more equally with the local elite.

## 3.7 Conceptual Model

The consensually integrated, plural and organisational elite models are relevant to a study of how elite configurations and interactions affect the structure and function of the CFUG. These models provide a means to develop a conceptual framework specific to the function of the CFUG. The conceptual model will help to deal with specific problems that pertain to Nepalese social structure and institutions in the context of CF in Nepal. The key elements of the elite models in the CFUG context, caste and wealth, form the basis of the conceptual model shown in Figure 3.1**.**

| | | Community Caste Structure | |
|---|---|---|---|
| | | One caste | Many castes |
| Wealth Status of EC Members | Rich Only | Consensually integrated elite model | Plural elite model |
| | Rich and Poor | Organisational elite model A | Organisational elite model B |

Figure 3.1 Conceptual models of elite in CFUGs

The top left represents a situation where the EC is composed of rich people in a community with one caste. In this case, the elite would be expected to behave like the consensually

integrated elite model where the elite have similar norms and status, and form separate, fluid, groups that reform into new groups as necessary. Top of the right represents a situation where the EC is composed of rich people in a community with many castes. In this case, the elite would be expected to act like the plural elite model since they will naturally form separate groups due to caste but be required to work together with other wealthy elite from other castes.

The participation of the poor is of the two forms related to the organisational elite model; in both cases the organisation can create the opportunity to be part of the elite or to create an elite group. When the poor are of the same caste as the rich, then the only issue they have to overcome to participate on the executive is their wealth status. This is called organisational elite model A, as in Figure 3.1. When there are many castes or ethnic groups, then the poor have to overcome issues related to their caste as well as their wealth. This is the organisational elite model B, as in Figure 3.1.

The major assumptions of the conceptual model of elite in CFUGs (Figure 3.1) are as follows. First, in a community where the EC is structured like the consensual elite model, one would expect to find only one caste and the rich dominating the EC, and this would be reflected in the distribution and rules of distribution that favoured the rich. Second, in a community where the EC is structured like the plural elite model, one would expect to find more than one caste and a mixture of the caste elite and the rich dominating the EC. This would be reflected in the distribution and rules of distribution that favoured the caste elite and rich. Third, in a community where the EC is structured like the organisational elite model A, or where the EC has a large proportion of poor, one would expect to find only one caste but the rich would not be dominating the EC, and this would be reflected in the distribution and rules of distribution that favoured the poor. Fourth, in a community where the EC is structured like the organisational elite model B, or where the EC has a greater proportion of poor or low caste, one would expect to find greater representation of low caste and the poor on the EC, and this would be reflected in the distribution and rules of distribution that favoured the low caste and the poor.

The conceptual model in Figure 3.1 provides an understanding of how caste and the wealth elite characterise themes of decision-making and formulation of rules, regulations and practices. In a community where the EC is structured like the consensually integrated or plural elite models, the domination of the EC by the rich would be reflected in distribution

amounts and rules of distribution that favoured the rich. In a community where the EC reflected the organisational A or B situations, it would be expected that the amounts produced and rules of distribution would be more favourable to the poor. The conceptual model provides the basis for examining the three research questions, which deal with the attributes that make leadership selection more likely, the amount distributed with representation of the poor on the EC, and the rules of distribution with poor representation on the EC.

### 3.7.1 Leadership Attributes

The attributes that determine leadership are an important dimension in the model. One of the hypotheses of this study is that the balance between elite, and poor and disadvantaged households in leadership of CFUGs determines CF management and benefit distribution decisions. Thus, it is important to determine what factors facilitate the representation of the poor and disadvantaged groups on the EC. This hypothesis is in the context of Nepalese society where the elite emerge due to caste and wealth. Wealth related factors include land holding size, livestock holdings, off-farm income and food sufficiency. The elite castes include *(Brahmins, Chhetari, Thakuri* and *Newar*) influenced the selection of leadership and benefit distribution from CF. The *Dalit* (lower caste or so-called untouchable) and the poor would be expected to participate in leadership, as in organisational elite A or B models, only if something other than the assets of the household, income and individual caste influenced the selection of leaders. The hypothesis is that a factor like leadership or organisational skills developed outside of the CFUG, such as with an NGO organisation, is important for being in a leadership position in a CFUG.

### 3.7.2 Rules, Regulations and Practices of Distribution

Leadership attributes are believed to be reflected in the rules of distribution for CF products. It is assumed that government policy about CF benefit distribution practices are not deliberately against any household. However, the lack of holistic rules and practices for the distribution of benefits and the lack of control over resources by the poor in communities is believed to lead to discrimination against poor households. To alleviate poverty, rules and practices should enable poor and low socioeconomic households to improve their own livelihoods. The hypothesis is that the rules, regulations and practices of distribution determined by the EC affect the level of production and distribution by the CF. The rules and regulations are, in turn, influenced by the type of decision-making, in this case whether the consensually integrated, plural, organisational elite A or organisational elite B models in

Figure 3.1 dominate decision-making. The rules and regulations of the CFUG may not reflect the preferences and requirements of poor and lower castes, if the consensually integrated elite or plural elite situations exist.

A number of factors are important to distribution. The longer the open period, the more benefits flow to poor households. This is because the poor and disadvantaged households do have not labour resources to collect sufficient products in a short period. Typically, they have to manage their household labour force to work for elite farms, farm their own properties and collect CF products. EC members control the CF open period and regulate the allocation of forest products in terms of collection days for timber, firewood, fodder and grass and leaf litter. The structure of the EC affects the benefit and rules of distribution particularly to the poor and low caste household that if the organisation elite models exist.

## 3.8 Chapter Summary

This review has resulted in a conceptual model that explains how two key attributes of social structure in Nepal, caste and wealth, can explain the structure of and decisions made by the EC of CFUGs, and the effect this has on benefits received by the poor and disadvantaged households from CF. If organisational elite models A and B were employed, the poor have an opportunity to participate as elite if they can get executive positions on the CFUG organisation that in turn benefits to them. The conceptual model provides the basis for an empirical analysis of the research hypotheses. The structure of the empirical analysis is outlined in Chapter 4.

# Chapter 4
# AN EMPIRICAL MODEL FOR THE SELECTION OF LEADERS AND BENEFIT DISTRIBUTION FROM COMMUNITY FORESTS

## 4.1 Introduction

Based on the conceptual model outlined in Chapter 3, this chapter describes an empirical research model to address the hypotheses of this study. It is believed that the selection of community leaders determines the structure of power sharing in a CFUG in the Chapter 3 in Figure 3.1 and that this has an effect on the distribution of benefits from local forests and rules of distribution. The literature review of elite models provided a background about the power structures that emerge due to caste and wealth. Lachapelle et al. (2004) found that both leadership and power emerge due to the caste and wealth structure in Nepalese society and that they then used this to obtain some public goods. Poteete and Ostrom (2002), Fisher (2007), Agrawal (2001), Agrawal and Ribot (1999) and Ostrom (1999) noted that power is the ability to influence processes by which individuals create rules, make decisions and implement them to affect the outcome of a decision-making process. This implies a genuine role in decision-making and not just as a token input in the form of consultation. This means that it is important to determine how power structures that include the poor and disadvantaged groups can be created. This chapter outlines the empirical framework associated with the attributes of community leaders, and factors that influence the rules and regulations of benefit distribution.

## 4.2 Empirical Framework

Households' benefits from CF depend not only on the stock of CF resources but also on access, which is affected by local decision-making. Key factors affecting households' benefits distribution are: (a) the type and attributes of leaders present on the EC and whether the consensually integrated elite, plural elite or organisational elite models apply; (b) the rules, regulations and practices made by the EC; and (c) the forest resources attributes. These factors form the empirical framework in Figure 4.1. The leadership attributes are one of the important components of the empirical model because, leaders are believed to be selected on the basis of certain household attributes. The leaders are elected from the community as EC

members of the CFUG. Once they have access to EC as leaders, the CFUG provides them with power to influence the formulation of rules for the distribution of CF benefits. The CF attributes such as forest area, forest type and crown cover class, also determine the types of products and amounts obtained from CF. Thus, the components in the empirical framework for modelling community forestry decisions are linked to the distribution of CF benefits.

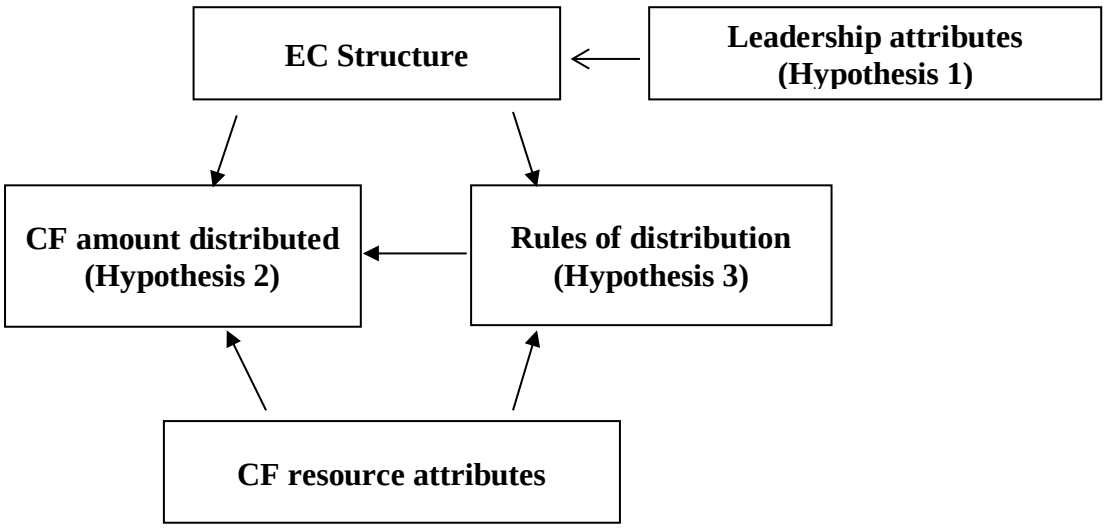


Figure 4.1 The empirical framework for modelling community forest decisions in Nepal

### 4.2.1 Leadership Attributes

This section looks at the correlation between household attributes and leadership selection. Depending on the community, this in turn influences which of the four elite models is relevant in a community. One of the hypotheses of this study is that the leadership in the CFUG determines community forest management and benefit distribution decisions; thus it is important to have representation from the poor and disadvantaged groups. In the context of the empirical framework, household attributes are the important factors when community members select a leader. As discussed earlier, the people with wealth and elite caste attributes are often selected as leaders. Based on the literature review, the probability of being selected to a leadership position is determined by ethnic caste, wealth, social status, and leadership experience outside the CFUG, such as with an NGO. There are three main attributes: (i) wealth, (ii) caste and (iii) outside leadership experience that needs to be developed. These are elaborated below.

#### 4.2.1.1 Wealth attributes

Wealth has a kind of power that can provide greater assurance of social status in society. The hypothesis is that wealthier household members who have assets like a bank balance, food sufficiency and maintain a life style with more than adequate material provisions have an influence in the selection of leaders. Wealth is a plentiful quantity of valuable resources or material possessions. It has either a positive or a negative influence in decision-making. Wealthier, high power and social status groups are more able to be selected as leaders and so influence the decision-making process (Lachapelle, et al., 2004). Power through wealth reduces the opportunities for poor households to be selected to leadership positions (Hansen, 2007). Lebel, Daniel, Badenoch, Garden and Imamura (2008) stated that wealthier households influence the selection of leaders in CBNRM in Asia. The wealth attributes correlated with CFUG leadership in Nepal are landholding size, livestock units, off farm income and food sufficiency. Each of these is elaborated below.

##### 4.2.1.1.1 Landholding Size

Landholding is believed to be an important factor in selection for leadership. There is evidence of a positive correlation between private land endowment and the use of public goods and resources. For instance, Adhikari (2005) found that large land endowments directly affected the ability to appropriate resources from community-based resource management. The social status of large landholders endows these people with more opportunities for leadership and influence over the executive decision-making process. Sangameswaran (2008) and Poteete and Ostrom (2002, 2008) observed that large landholder farmers in India benefited from the Watershed Development Projects through control over community decision-making. The economic value and social capital, like large landholding size, appear to play crucial roles in deciding leadership positions and promoting management of forests in Joint Forest Management (JFM) in India (Behera, 2009). Maskey et al. (2006) found that households with a large landholding participated considerably more in decision-making in CF management in Nepal. Hence, landholding could be positively correlated with selection as a leader.

##### 4.2.1.1.2 Livestock units

Livestock holding is one of the indicators of social power and CF is an important source of feed for livestock (Food & Agriculture Organisation, 2005; Malla, et al., 2005; Sekhar,

1998). Households with bigger livestock holdings (or less poor households) are expected to benefit proportionally more from CF because the management regime of CF is often oriented to the production of fodder products for livestock for forest users (Richards, Kanel, Maharjan, & Davies, 1999). The difference in the use of local forests may be associated with the number of livestock units raised by households. Wealthier households, with larger herds and more land, have greater need for animal fodder and agricultural compost (Varughese, 1999), which, in turn, creates farmers who would be interested in a leadership position (Sekhar, 1998).

#### 4.2.1.1.3 Off farm income

The hypothesis is that there is a higher probability of being a member of the EC if a household has enough off-farm income. A. Agrawal (2001) found that low income households have the lowest levels of leadership positions.

#### 4.2.1.1.4 Food sufficiency

Food sufficiency can play a role at a local level, particularly in the selection of leaders in a CFUG in Nepal (A. Agrawal & Goyal, 1999; R. Pokharel, 2009). The hypothesis is that there is a higher probability of being a member of the EC if a household has food sufficiency from its own farmland. Food sufficiency in this study is classified into 12 months and more, harvested from the household's own land, enough food for 12 months, 9 months, 6 months, 3 months or less than 3 months.

#### 4.2.1.1.5 Occupation of household head

Among other factors that determine the selection of leaders, the occupation of the household head plays an important role. Compared with households with the head self-employed in agriculture, agricultural occupational households depend more on forest resources and households in non-agricultural occupations depend less and are likely to have access to other sources for forest resource use (Adhikari & Di-Falco, 2009). Hence, agricultural occupation households are expected to pay more attention to leadership positions in CFUG than households in non-agricultural occupations. It is hypothesized that business owners and teachers will be less likely to seek leadership in the CFUG. This is because need for other occupation households to access forest resources would be less since they are less likely to be interested in leadership positions on the CFUG (A. Agrawal, 2007).

#### 4.2.1.1.6 Ethnic caste and social status

Ethnicity and social status play important roles in the selection of leaders for CFUGs. The disadvantaged groups depend more on forests for forest products and other local services to satisfy their basic needs compared with the elite ethnic caste (Acharya & Gentle, 2005). Meinzen-Dick, Pandolfelli, Dohrn and Athens (2006), Acharya and Gentle (2005) and Weinberger and Jutting (2001) found that in the exclusive *Dalit* group, CFUGs provided more opportunity for the poor to choose a position of leadership. For example, Nemarundwe (2004) and Bourdieu (1984) found that social stratification with an elite caste allowed elite people to succeed or rise to powerful positions over management structures as well as having a crucial say in who was elected into which position and which leaders got more respect in all key decision-making and village meetings. The elite castes often use their position to ignore rules put in place by other leaders due to their higher status. Timisina (2002), Pradhan and Shrestha (2005) and Meinzen-Dick, Brown, Feldstenin, Quesumbling and Agnes (1997) found that lower castes have fewer opportunities to be leaders. Disadvantaged groups (*Dalit* and lower castes) are less likely to be chosen as leaders. Due to the deeply rooted caste and social stratification systems, particularly the higher caste and lower caste with unequal power relationships in Nepalese society, it has been demonstrated that the elite caste and wealthy powerful households are selected for positions as EC members of CFUGs in Nepal and India (Adhikari, et al., 2004; Adhikari & Lovett, 2006; A. Agarwal & Ostrom, 2001; A. Agrawal, 2007; A. Agrawal & Chhatre, 2006; A. Agrawal & Goyal, 1999; A. Agrawal & Gupta, 2005; Iversen, et al., 2006; Lachapelle, et al., 2004; Maskey, et al., 2006; Nagendra & Gokhale, 2008; Ostrom, 2011; Thoms, 2008).

### 4.2.1.2 NGO membership

The basic hypothesis is that if a person is a member of an NGO, then there is a higher probability of being selected as a member of the EC. Participation in an NGO might have developed a person's leadership capacity or motivated them to be a leader. NGO personnel have increased empowerment and the inclusion of *Dalit, Janjati* and disadvantaged groups, particularly in developing leadership capacity, increased the benefits from rural development activities (Jha, et al., 2009). Ui et al. (2010) found that the role of local NGOs is critically important in influencing the community representatives in participation for sustainable health

development in Cambodia. Hence, if poor and oppressed lower castes have the opportunity to develop their leadership capacity, they could be represented more in the EC.

### 4.2.2 Econometric Model for Examining CFUG Leadership

This research hypothesises that the selection of an individual *($Y_i$)* in a leadership position of the CFUG is a function of household attributes as follows:

$$\text{Leadership } (Y_i) = f(\text{Landholding size, Food sufficiency, Livestock units, Occupation of household head, Wealth status, Off farm income, NGO membership, Ethnic caste}) \quad 4.1$$

The attributes of leaders are examined by analysing a regression model. The variable whether a member ($Y_i$) is in a leadership position on the EC is binary (Yes/No). For the econometric application, the variable $Y_i$ can be coded as one if the individual is selected for the executive committee and zero otherwise. The independent variables are landholding size, wealth status, livestock units, off-farm income, food sufficiency, NGO membership, family size of the household, ethnic caste and education.

For discrete choice analysis, there are two commonly used econometric models: the logit and probit models (Agresti & Finlay, 2009). The logit model consists of the logistic normal distribution of the error term whereas the probit model holds a cumulative normal distribution of error term (Agresti, 1990). The choice between models depends on the best fit of the data. The simplest approach, in order to choose the better model, is the robustness of R-square value.

The distribution of the data of this study supports a logit model. The logit model is based on probability theory that examines the probability of being in a leadership position. In the logit distribution, the estimated probabilities are constrained between 0 and 1 (Agresti, 1990; Agresti & Finlay, 2009).

$$Ln[p/(1-p)] = a + BX + e \quad \text{or} \quad [p/(1-p)] = \exp(a + BX + e) \quad 4.2$$

Where:

$p$ is the probability that event Y occurs, $p$(Y=1);

$p$/(1-$p$) is the "odds ratio"; and

ln [*p*/(1-*p*)] is the log odds ratio, or "logit" and all other components are similar to the linear model.

The analysis of the relationship of several independent variables to a dichotomous dependent variable is the selection of leadership positions on the EC of CFUG, which leads to a binary dependent variable (yes or no) and the use of the logistic regression (Agresti, 1990).

$$\text{Logit (P)} = a + bX \qquad 4.3$$

Where P = Logistic, which is assumed to be linearly related to X. The logistic regression equation for predicting leadership is shown in equation 4.2. The underlying model is, therefore, that a leadership role ($Y_i$) will be some function of particular social attributes ($X$):

$$Y_i = \beta_0 + \sum_{j=1}^{n} \beta_j \ln X_{ij} + e \qquad 4.4$$

Where $Y_i$ is the leadership status of individual i. $\beta_o$ is the intercept, $\beta_j$ is the coefficient for the explanatory variable for $X_{ij}$ for attribute j for individual i and e is the error term. The error term of the binary logistic model is assumed to have a logistic distribution with mean zero E $(\varepsilon)$ =0 and variance ( $\varepsilon$ ) =$\pi^2/3$.

## 4.3 Benefits Distribution (CF amount)

The quantity of CF products distributed is determined by rules and practices that are formulated and implemented by the decision makers of the CFUG as well as forest attributes. Formal and informal resources management and the distribution of benefits rules have been found to be crucial for collective decision-making action (Baland & Plateau, 1996; Berkes, Feeny, McCay, & Acheson, 1989; Ostrom, 1990). The CFUG organisational body (the EC) forms these rules and regulations as well as the practices of resource distribution. It is hypothesised that CFUG rules, regulations, norms and practices will be formulated to maximise benefits from CF for those who dominate the EC. Blaikie (2006) and Yadav, Dev, Baginski and Soussan (2003) found that there is a lower level of satisfaction with benefits distributed from CF in small and landless households. They argued that forest products distribution systems do not meet their needs and they lack participation in the decision-making processes. It is believed that, if the rules, regulations and practices are devised with full participation of the poor and underprivileged members of the society and in favour of

them, then the distribution of forest products including firewood, fodder, leaf litter and timber will be equitable.

To analyse the distribution of benefits from CF, a linear regression model was constructed to identify the relationship between the distribution of forest products from CF and a range of explanatory variables. The dependent variables are the relative distribution of firewood, timber and fodder. Relative distribution was used because of unequal forest endowments among CFUGs. The relative distribution of CF products was calculated by dividing the quantity of a product distributed to a household by the average relative amount distributed to each household in that CFUG, which means that absolute amounts distributed will vary between CFUGs. Since what is important here is the relative amount received by each household compared with other households in the CFUG, relative distribution is the better measure. If the relative distribution is 1 it means that the household gets the average distribution. If the relative distribution is more than 1 then it means that the household gets a disproportionately larger share of the distribution, and if it is less than 1 it means that the household gets a disproportionately smaller share of the distribution. In the context of this research, relative distributions that are greater than 1 for the rich or less than1 for the poor are undesirable.

The independent variables are the rules, regulations and practices of distribution, and the forest characteristics. The rules, regulations and practices for this research are the frequency of EC and assembly meetings, the discussion hours per meeting in the EC and assembly, the agenda items raised by various members in the EC assembly meetings and the involvement of the EC and assembly meeting in the preparation of the Operation Plan (OP). The forest resources variables included area per household, crown cover class and forest type. Following Adhikari et al. (2004), the distribution model is as follows:

> Relative distribution per household in a CFUG = *f* (frequency of EC and assembly meetings, discussion hours per meeting in EC and assembly, agenda items raised by poor and disadvantaged in EC and in assembly meetings, involvement of EC and assembly meeting in preparation of operation plan, area of forest per household, crown cover class, CF type, share of EC position held by the poor). 4.5

Linear regression is preferable because the dependent variables are continuously distributed. The model is estimated using the maximum likelihood estimation and the log likelihood function for the relative distribution of CF products. The following section starts with a description of the dependent variables.

$$Y_i = \beta_o + \beta_i + \sum_{j=2}^{n} + \beta_{ij}^{z} X_{ij}^{z} + e_i \qquad 4.6$$

Where $Y_i$ = the relative distribution of CF products to individual I, j = timber, firewood, and fodder, $X_{ij}$ represents the set of explanatory variables and $e_i$ is the error term for the linear regression model with a mean of zero and a variance of one ($\varepsilon \approx N$ ($\mu = 0$ and $\sigma^2 = 1$). Therefore, an appropriate computation of standard error (S.E.) is estimated using the maximum likelihood method.

### 4.3.1 Representation of the Poor on the EC

It is assumed that if the majority of members of the EC represent the poor wellbeing category, the decisions made by the EC will be more favourable to poor households. Katz and Kahn (2005) and Adhikari et al. (2004) found that in many forest resource systems, poor household members who have a majority in decision-making, made decisions that met their own needs. Moreover, Jones (2007) and Pfaff (2000) found that a considerable level of decision-making power was retained by the elite members of the user committee and that they dominated the decisions. They argued that the leaders are able to devise their own management policies based on their vested interests and this did not represent the lower castes and poor and ignored the needs and voices of those people in society. Similarly, Sunam and McCarthy (2010) and Hobley (2007) found that the issue of the needs of the poor were rarely discussed in EC meetings and in the decision-making forum where elite were in the majority.

The proportional representation of the poor among EC members is an important determinant for benefit distribution in common land (Hansen, 2007; Ostrom, 2005, 2008; Vedeld, 2000). The elite mostly made the distribution rules and regulations on the basis of their interests (Hansen, 2007). *Brahamin, Chhetry, Thakuri* and *Newar* (elite castes) are wealthier (rich) households that are influential and well off in society. They have influence in the allocation of open days for their own demands (Bistha, 1991; Gurung, 2005; Pradhan & Shrestha, 2005). Therefore, it is expected that if there is greater representation on the EC by the poor,

there is a greater probability of having higher relative distribution in favour of poor households.

### 4.3.2 Agenda Items Raised in the EC and Assembly Meetings

In order to conduct a well organised and efficient meeting, agenda items are important tools that can influence the outcome of the meetings. In the different stages of the decision-making process at the community level, contributions are made at several levels by local users. Acharya and Gentle (2005) found that when poor households raised a larger number of agenda items in meetings, they got proportionally more CF products. It is assumed that if the poor and disadvantaged members could raise more agenda items, they would collect relatively more firewood, timber and fodder. This would be consistent with the organisational elite model where increased participation by the poor through the structure of the organisation provided them with power to change the outcomes of decisions. However, many difficulties lie within the fact that the Nepalese CFUG structure is based upon a patron-client relationship (Hansen, 2007). The usual hierarchical structure supports the consensual elite and plural elite models and does not give much opportunity for the poor and disadvantaged people to be heard in raising agenda items since they do not have equality (Arnold & Campbell, 1986; Baland & Plateau, 1997; Bartley, et al., 2008; Jones, 2007).

### 4.3.3 Frequency of EC and Assembly Meetings

Dhakal (2006) asserted that there is a greater probability of addressing the issues of the underprivileged and women with an increase in the frequency of EC meetings and CFUG assemblies. The assumption is that if more EC and assembly meetings are organised by the CFUG organisational elite where consensually integrated elite and plural elite feel free to provide a greater opportunity for the poor and disadvantaged to raise their needs. The reason behind this is that frequent meetings could allow sufficient time for the EC and assembly meetings to think and discuss many agenda items including benefits for the deprived group. The groups with more frequent meetings could have a positive relationship with the relative distribution of CF products to the poor (Dev, et al., 2003).

### 4.3.4 Discussion Hours in EC and Assembly Meetings

The influence of discussion hours is one of the important factors when observing the relationship between dominance and speaking time (Mast, 2002). With shorter times for discussion in meetings, individuals are strongly driven to dominate others for their own goals.

The effect of more discussion hours would be to enable disadvantaged groups the opportunity to discuss their problems. If the discussion time is shorter, they could be penalised (B. Agarwal, 2009; Kubo, 2009). Hence, longer discussion time in the EC and assembly meetings is believed to provide more opportunities for the poor to raise their concerns and obtain benefits from CF in Nepal.

### 4.3.5 Involvement of EC and Assembly Meetings in the Preparation of the Operational Plan

The involvement of EC and assembly meetings is an important procedure in the preparation of the operational plan (OP). It is hypothesised that the involvement of assembly meetings in the preparation of the OP provides more benefits to the poor and disadvantaged people. The assembly meeting is more relevant than the EC meeting in contributing to a positive impact in the preparation of the OP and management of the CF. This is because, when the majority of EC members belong to the elite and wealthier households, the EC will not reflect the needs and aspirations of the poorer and socially disadvantaged members in the preparation of the OP (Thoms, 2008). Jones (2007) and Nayak and Berkes (2008) found that most people belonged to general households in assembly meetings and there was less chance of elite dominance of the meeting. Hence, involvement of the assembly in the preparation of the OP, including forest management, harvesting, protection and sharing of benefits, gives a greater chance of fairness compared with the involvement of only the EC in the preparation of the OP.

### 4.3.6 Forest Attributes

The forest attributes included here are forest type, forest area per household and forest crown cover class. These attributes have an effect on the forest quality and the types of products available from the forest (Alkan, et al., 2008; Franco-Lopez, Ek, & Bauer, 2001). The detail of forest attributes is elaborated in the following section.

#### 4.3.6.1 Forest Type

Broadleaf forests produce multiple products. Poor households are likely to benefit in CFUGs with a mix of broadleaf forests (A. Agrawal, 2005). Huang, Wang, and Yan (2007), Zerbe and Kreyer (2007) found that broadleaf forests provide more intermediate harvesting with multiple products and sustain longer open periods than conifer forests. Broadleaf forest provides more firewood than conifer forest. It is believed that poor households are likely to

maximise their benefit with a mixed forest or broadleaf forests rather than conifer forests because the conifer forests areas are acidic and there is little chance to grow broadleaf fodder species and lawn grass (A. Agrawal, 2007; J. K. Jackson, 1994).

#### 4.3.6.2 Forest Crown Cover Class

Crown cover of the forest represents the land covered. Crown cover class is expressed as the percentage of crown area projected on to land area. If crown cover is dense and rich, it denotes that biological materials such as grasses, trees and crops are very high but if crown cover is poor or thin, it denotes that biological materials are poor on the ground. Crown cover percentage is the central element in forest management particularly for the estimation of yield (Gautam, et al., 2004). Thapa and Chapman (2010) and Maraseni, Shivakoti, Cockfield and Apan (2006) found that a high crown density, primarily the shade-tolerant hardwood species (maples, yellow birch), allowed longer open periods than those of lower crown density. It is hypothesized that a higher proportion of crown coverage, the greater are the number of open days for the community forest as a distribution rules.

#### 4.3.6.3 Area of Forest per Household

Larger areas of forest per household mean more resources. It is hypothesised that the larger the area of forest per household the longer the open period for the collection of the CF products. Resource scarcity problems with benefit distribution could be negatively related to forests of small area (and resources). Nagendra, Pareth, Sharma, Schweik and Adhikari (2008), Lawrence, Paudel, Barnes and Malla (2007) and Ostrom (1990) stated that the quantity of CF resources is directly related to the amount of CF land area necessary for growth and yield. If the area is small, the volume of products is also small and this may cause the decision-makers to enforce shorter open periods.

## 4.4 Rules of Distribution

In this component of the conceptual model, the rules of distribution are analysed. In highly devolved structures, one of the main challenges is how to design institutions, elect leaders and make rules so that leaders have an incentive to support local users to distribute the benefits obtained from CF on an equitable and equal basis (Andersson & Ostrom, 2008; Mudgal, Morrison, & Mayers, 2004). The rules of distribution are specific times for open periods for the distribution of forest products (Domencich & McFadden, 1975). It is believed that wealthier households need fewer open days to meet their needs and that poorer

household need a longer period to meet their needs. It is also believed that the more poor on the EC the longer the opening period and the greater the benefits to the poor.

Adhikari and Lovett (2006) found that if CFUGs had a short open period of the community forest there was a potential problem for poor household members to collect enough firewood compared with the rich and elite households. They argued that the rules and regulations were shaped by EC members based on the personal interests of the individuals in terms of fixing the harvesting periods for CF products. This is due to both the economic interests to fix a time period and the individual interests of EC members (Malla, et al., 2005; Stræde & Treue, 2006). Shorter extraction periods of forest products have less chance of fulfilling the demands of the poor and low socio-economic groups in CBNRM (Nagendra & Gokhale, 2008; N. S. Paudel, Banjade, Ojha, McDougall, & Prabhu, 2006; Rendón-Carmona, Martínez-Yrízar, Balvanera, & Pérez-Salicrup, 2009). Poor people do not manage to collect sufficient CF products in a shorter harvest period.

The open period for distribution of CF products is the dependent variable. The hypothesis is that, if there are more poorer represented on the EC, the opening period will be longer. The independent variables included for the study of distribution rules are forest type, CF area per household, forest crown cover classes, relative proportion of EC positions by the poor. This relationship is shown in equation 4.7.

> Number of days for opening CF = $f$ (Relative proportion of EC position held by the poor and disadvantaged, forest type, forest crown cover classes, forest area per household) 4.7

In this model, the hypothesis is that CF product distribution rules have been developed in a way that reflects the composition of the EC. Three regression models are used based on the number of days the community forest is open for harvesting and distribution of timber, firewood and fodder. This relationship is shown in Equation 4.8:

$$Y_i^z = \beta_0^z \sum_{j=1}^{n} + \beta_{ij}^z X_{ij}^z + e^z \qquad 4.8$$

Where $Y_i^z$ represents the number of open days for the distribution of timber, firewood and fodder per year for the CFUG; j = timber, firewood, and fodder; Xij represents the $j^{th}$ explanatory variable for the ith CFUG; and the error term is $e^z$.

Discrete Choice Ordered (Ordered Logit model) regression is preferable because the dependent variable is the open period and the responses assume discrete values of 0, 1, 2 or 3. The model is estimated using the maximum likelihood estimation and the log likelihood function for observed choices (Greene, 2000; Scott & Freese, 2006; Small, 1987). Independent variables are discussed below.

### 4.4.1 CF Resource Attributes

The forest attributes described in section 4.3.6, particularly forest type, area of forest per household and forest crown cover class, are also used for the analysis of distribution rules.

### 4.4.2 Proportion of Poor Households on the EC

The proportion of poor households on the EC could also play a role in the open period. It is assumed that the higher the proportion of the poor households on the EC the longer the number days for the CF open period. The argument is that the voices and issues concerning minority groups (poor and lower caste) could easily enter into the collective decision-making when they are represented on the EC (Adhikari & Di-Falco, 2009; Laerhoven & Ostrom, 2007). Therefore, if poor households have a proportionately higher representation on the EC, there is a higher chance that this would lead to longer open periods of the CF, which helps poor households.

One can raise the question that if there is a longer open period of the CF, it could affect the sustainable harvesting of CF products. The problem here is that even if allocation of the CF products is fixed in a sustainable design, poor households will not have enough resources and time to extract the allocated product in the fixed short open period of the CF whereas the rich can extract their allocated portion from the forest. It is a fact that a higher representation by the poor on the EC reflects the organisational elite model, where the poor are empowered by the CFUG institution.

## 4.5 Conclusion

The attributes of a person in leadership are important in the empirical model. One of the hypotheses of this study is that the composition of leadership and decision-making in the CFUG determines the benefit distribution from CF. This hypothesis is in the context of an empirical model whereby household attributes are one set of assets available to a household in being selected as a leader. Typically, ethnic elite castes, social status, food sufficiency, off-

farm income, landholding size, livestock units and occupation of household head mean that the traditional elite in a community have a greater likelihood of selection as leaders on the EC. In this case, decisions follow the behaviour outlined by the consensual and plural elite models. However, for poor and disadvantaged group members, experience in external leadership positions, such as in NGOs, is also believed to increase the likelihood of selection on EC positions of CFUGs. This would be reflected in the presence of the organisational elite model.

The distribution of CF products to households is also believed to be correlated with the attributes of the EC that in turn affect the outcome of the decision-making process of the group. The hypothesis is that the social structure of the EC determines the distribution of benefits, which may disadvantage poor households and benefit the elite wealthier households. However, in the proposed conceptual model with the organisational elite model, poor and disadvantaged members would participate on the EC and help formulate rules, regulation and practices. The dependent variables are relative distribution of firewood, timber and fodder. The independent variables are frequency of EC and assembly meetings, discussion time per meeting in the EC and assemblies, agenda items raised by poor and disadvantaged members in the EC and assembly meetings and the involvement of the EC and assembly meetings in the preparation of the OP, area per household, crown cover class and CF type.

How the rules of distribution are determined by the leaders on the EC is one of the main challenges in designing institutions, electing leaders and making rules so that leaders have an incentive to support to poor and disadvantaged groups in distributing CF products. The distribution rules are measured as open periods for the distribution of firewood, timber and fodder. As hypothesised, caste and wealth elite households need fewer open days and poor households need more open days for collecting CF products. The independent variables are proportion of poor and poorest households represented on the EC and the physical constraints of the CF resources, CF area per household, forest type and crown cover class.

# Chapter 5
# SURVEY AND DATA COLLECTION

## 5.1 Introduction

Statistical data are very important in any research. The accuracy of the findings depends on features of the data that affect their quality or "fitness" for processing and analysis. The CFUGs chosen for this study are spread throughout a district where there are diverse socio-economic classes and castes. When selecting the study area, several factors such as constraints on resources, timeframe and the choice of methods for data collection were considered. More importantly, personal security during the field survey was a major factor to be considered. Security issues concerned the presence of armed rebels who were active during the fieldwork. Because of poor security, the *Siraha* and *Panchthar* districts had to be omitted limiting the fieldwork to *Baglung*.

In the previous chapter, the conceptual, empirical and econometric models for community welfare were explained. This chapter presents the reasons for selecting *Baglung* district, gives an overview of the research site, a household survey, and describes the instruments and data used. Finally, a conclusion ends the chapter.

## 5.2 Reasons for Selecting the *Baglung* District

The *Baglung* district is one of the middle hill districts of Nepal where the community forestry programme has been conducted since 1990. This district is considered to be a very active district among the mid hills districts, particularly in the management of CF. Also, the existing species composition of the forest in *Baglung* is similar to the mid hills throughout Nepal. The Nepal UK Community Forestry Programmes (NUCFP) conducted by the Department for International Development (DFID), UK, has supported the development of CF since 1991. Currently, it is conducted by the Livelihood and Forestry Programme (LFP). The main contribution of the programme has been to support the District Forest Office (DFO) in strengthening and developing the institutional buildings, including developing a database of CFUGs regarding CF. Hence, relevant secondary data are easily available from the CFUGs and district forest office records. In addition, many studies have been conducted on other aspects of CF management, particularly for the pro-poor programme to raise the livelihoods

of poor households through CF, which is new in other regions of the country. The district headquarters are easily approachable and a wide range of CFUGs are available for study.

One of the objectives of this research was to study the effect of social structure on benefit distribution from CF. As stated previously, Nepal is a country of diverse social structures particularly in religion, culture and ethnicity, and *Baglung* itself is also diverse in religion, culture, ethnicity, altitude and temperature, like other mid hills and mountainous districts in Nepal. Hinduism and Buddhism are the major religions. *Brahmin, Chhetry, Newar, Magar, Gurung, Chhantyal* and *Thakali* are the main ethnic groups in a population of 268,938 (Gurung, 2005). Hence, the district represents a typical hill region of the country so that the findings could be applied widely to other hill and mountain districts of Nepal.

## 5.3 Overview of the Baglung District

*Baglung* lies in the mid hills area of the western development region of Nepal. The study area comprises *Bhakunde, Titang, Resh, Malika, Payunpata, Sigana,* and *Palakot* Village Development Committees (VDCs) and *Kalika* municipality, which is 72 kilometres south-west of *Pokhara,* headquarters of the western development region of Nepal (Figure 5.1). This district is supported in the implementation of CF activities by the Livelihood and Forestry Programme (LFP), which is the part of the UK *Department for International Development* (DFID) project.

The geographical position of the district is between latitude 28.2667′ N to 28.037′ N and longitude 82.000′ E to 83.036′ E. The district is characterized by mountainous topography ranging in altitude from 583 m to 4,690 m above amsl (District Development Committee, 2004). It covers 1841.29 square kilometres. The climate is humid warm temperate to humid cool temperate with an annual range of mean temperatures from $12^0$ to $18^0$C (District Development Committee, 2004). The district receives a mean annual rainfall of 2200 mm (District Development Committee, 2004).

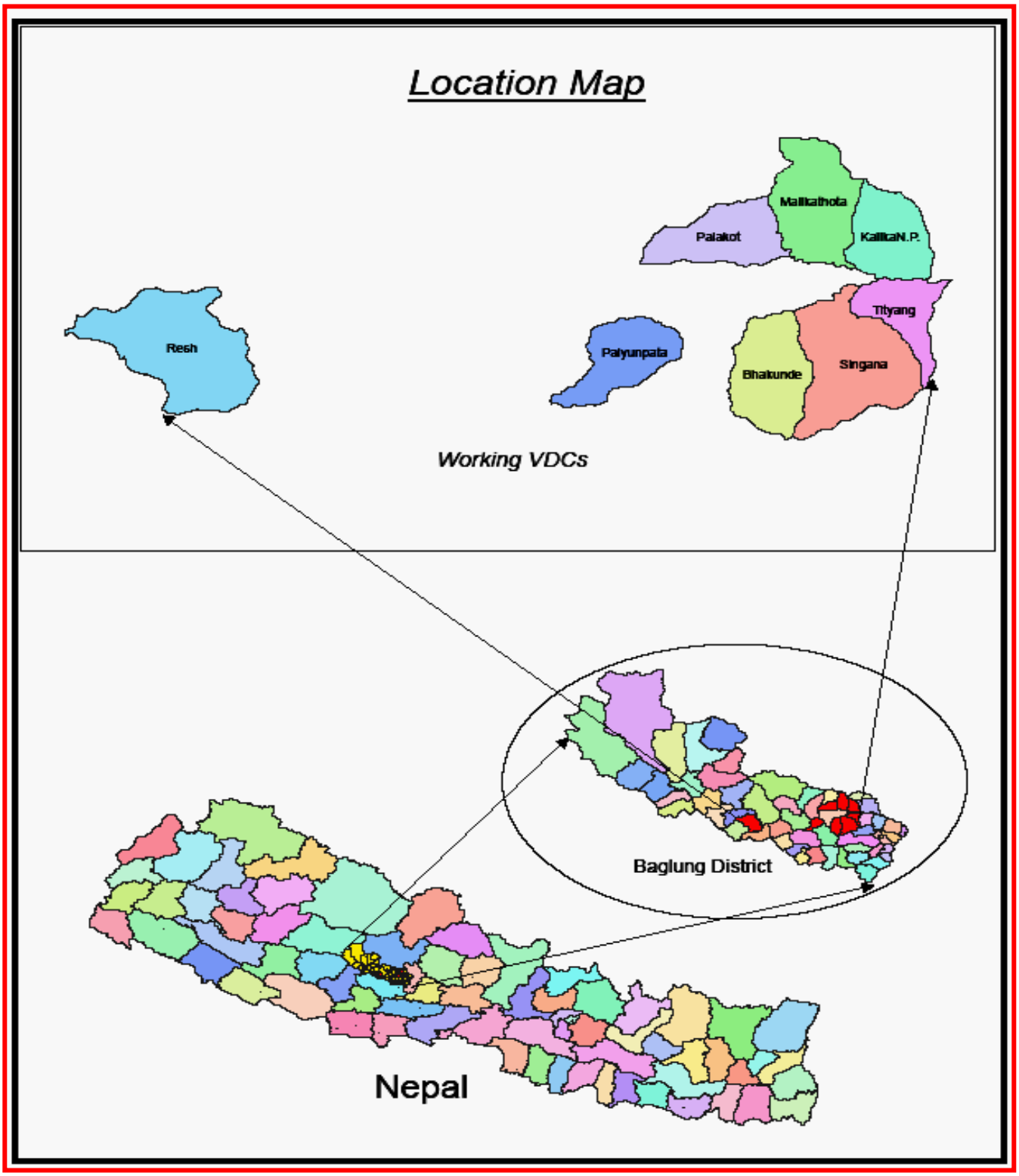


Figure 5.1 Map of Nepal showing *Baglung* district with the research areas; *Kalika* municipality and research VDCs, highlighted in red colour.

Agriculture is the main subsistence source for rural people. The main crops are rice, wheat, maize, millet and mustard. There are four types of land for crop production, *Bari* (non-irrigated), *Karbari* (non-irrigated for trees, fodder and horticultural crops), *Khet* (irrigated

land) and *Butyan*, particularly for trees and grasses. *Bari* land is generally used for cultivating maize and millet whereas *Khet* land is for cultivating rice, wheat and, occasionally, maize. From the household survey and group discussions carried out for this thesis, over 30 varieties of cereal crops were identified including rice, potatoes, maize, mustard, wheat, and finger millet. The research sites in *Bhakunde, Titang, Resh, Malika, Payunpata, Sigana, Palakot* VDCs and *Kalika* municipality are considered to be good areas in the mid hills for CF management and crop production. Conventionally, agricultural land, especially *Khet*, does not generally contain trees. However, a few indigenous and exotic trees, and horticultural crops are being planted in *Kharbari* and *Bari* land. Traditionally, farming households keep livestock such as buffalo and cows for milk production, sheep and/or goats for meat, and oxen or bull-buffaloes for draught power.

### 5.3.1 Forest Area

The total forest area of the *Baglung* district is 98,046 ha of which 17% is coniferous forest, 52% is hardwood forest, 23% is mixed forest and 8% is shrub land. According to the District Forest Office (DFO) statistics of *Baglung,* 17,574 ha of forest have been handed over to 407 CFUGs comprising 56,790 households (District Forest Office, 2009). The community forests surveyed for this research contain conifer forests, particularly on south facing slopes between 1,000-2,200 m that are dominated by chirpine (*Pinus roxburghii*), in high altitude with Blue pine *(Pinus wallichiana*) and broadleaf forests composed of *Shorea robusta, Schima walichaii* and *Castanopsis indica.* Riverine forests with toona *(Cedrela toona)* and *Albizia procera* also occur in mixed forests associated with broadleaf or conifer forests (District Forest Office, 2009). The per capita forest area is 0.36 ha in *Baglung* whereas, at the national level, it is 0.27 ha (Oli & Shrestha, 2009).

## 5.4 Survey Instruments

The data required for the empirical models includes a number of household and CFUG attributes. This data was collected using surveys. The survey instruments needed to provide valid, unbiased and complete results. The data were collected from different sources. The survey instruments used were: (1) a survey of household heads; (2) a survey of the members of the Executive Committee; and (3) secondary sources.

Field data collection is the most reliable way to get comparable data with the best validity. However, more observations do not always result in a more representative sample. Trade-offs

between the quantity of observations and geographic width affect both the research analysis and the validity of the data (Poteete & Ostrom, 2008). There are also constraints on resources, timeframe and the choice of methods for data collection. Hence, it has been considered that effort focus on balancing high quality data with the need to achieve the goals and objectives of the research.

According to the social structure of Nepalese society and its practices, women are usually responsible for the management of household activities and men manage the work outside their house and in the community. Hence, women possess more household information regarding the household management such as cooking resources, vis-à-vis firewood, fodder and grass to feed livestock. Men are accountable for creating the environment for their partner to access these resources. Hence, to standardize the survey, both women and men were interviewed.

The survey team comprised eight members including the principal researcher. The team was administered and oriented with in-house training particularly about the survey method, survey techniques and the objectives of the survey. A pilot survey was carried out on both small and large size households inside and outside the survey area to obtain validity and information about how well the draft questionnaire performed. The pilot test was conducted in 10 households comprising rich, medium, poor and poorest households in two CFUGs, one outside and one inside of the survey CFUGs. Members of the survey team participated in the pilot test and all interviews involved in the test. The pilot test provided an excellent training experience for the interviewers regarding the design, question settings and information provided by households and an estimate of the amount of time needed to complete the questionnaire. This test also provided ideas, information and exposed flaws in the questionnaire. As the questionnaire was translated into the Nepali language further ideas about errors, accuracy, sequence, clarity of the content conveyed and any differences between the English and Nepali language questionnaire due to loss or change of data due to translation were also provide by the interview team. The pilot test not only gave idea about translation pitfalls of the draft questionnaire a check for the overlooked problems but also provided the entire field work plan, including the supervision methods, editing and modifying some questions, and testing of the entire process so that the team could be assured that the survey was ready for implementation.

The interview team provided information about the objectives of the survey to the respondents and set out the meeting time beforehand to conduct the real survey so that most respondents had the opportunity to attend an interview. Attendance rates for interviews were over 95%.

Before the survey, meetings were organised with key informants, executive committee members of CFUGs, government officials including the District Forest Officer of *Baglung*, local non-governmental organizations and interest groups (e.g., associations, forest traders and craftsmen). The aim of these meetings was to get a general overview of the conduct, governance and performance of the CFUG programme and compile a list of participating CFUGs from which the interviewees were selected. There were CFUGs member meetings in each of the selected CFUGs to inform them about the objectives of the survey, how the survey operated at the CFUG level, and how to compile household lists from which households were selected by stratified random sampling for the survey.

## 5.5 Sampling

Household level data were collected by stratified random sampling from 10 households in each CFUG representing rich, medium, poor and poorest household heads. There were 310 households surveyed from 31 CFUGs. It was determined that at least two households be selected from each wellbeing category and two households were selected from any category depending upon the availability of household heads. Very few households had a woman as a household head. Hence, it was also decided to select women as far as applicable and available for interview.

Households were also selected to represent community social structures and ethnic caste composition. Most peasants in rural area have a low standard lifestyle. Each CFUG identified and collected information about household income and expenditure as well as a wide range of demographic information from individual households including the wellbeing categories of user households included in the composition of the CFUG. In reference to the DFO *Baglung*, household income was defined as the sum of the gross income received by each household member aged 18 years or over from following sources:

1. wages and salaries, including payment for piecework for the previous 12 months of earning;
2. self-employment income (defined as the tax profit/loss of the business);

3. work and income benefits and pensions; and
4. income from investments (including interest, dividends, rent (net of expenses) and royalties).

Hence, the survey team followed these identified wellbeing categories compiled by the CFUGs in selecting a household for interview. The description of the questionnaire development is given in the next section.

## 5.6 Questionnaire Development

The main sources of data were the household survey and the CFUG-level survey conducted in seven Village Development Committees (VDCs) and one *Baglung* municipality between August and October 2007. A team of eight members, including the principal researcher, administered the household and EC member interviews in 31 CFUGs in *Baglung*. The CFUGs were randomly selected based on the information from the DFO and District Level Community Forestry User Group Federation (FECOFUN) of *Baglung*. The survey was approved by the Human Ethics Committee of Lincoln University, New Zealand. The questionnaire was also verified by the Senior Social Researcher and social foresters and pretested in Nepal. The questionnaire was administered by a survey team under the guidance of the principal researcher. The following section describes the household survey.

### 5.6.1 Household Survey

A household survey was carried out by generating a list of the household heads and the list was also verified with the constitution of CFUGs. The survey included information about household attributes and private endowments. A structured questionnaire was prepared for the household survey. The questionnaire was divided into four parts. The first part covered general information about household demographics such as livestock holdings, land holdings, off-farm income and the education of the household head. Livestock information included the numbers of buffaloes, cows and goats/sheep. Off-farm income included cash income from jobs, business and sale of products. Wellbeing category was confirmed with the CFUG information. Landholding included areas of *Khetland* (irrigated), Bari land (non-irrigated) *Kharbari* and *Butyan* land. The respondents were also asked whether their food production was over 12 months food sufficiency, 12 months food sufficiency, 9 months food sufficiency, 6 months food sufficiency, or 3 months and less food sufficiency.

The second part covered social structure information including ethnicity, caste, religion, language, age, marital status, household size and occupation of household head.

The third part of the survey covered the leadership selection process and experience as a leader. All respondents were asked whether they had ever been an executive committee member in the CFUG and/or been a leader in a NGO. They were also asked about the structure of EC and its role in the decision-making process for the distribution of CF products.

Finally, they were also asked about the CF resources and the amount and distribution of products obtained from CF. The survey included the amount of CF products collected by households from the community forest. Respondents were also asked the distance from their household to the community forest, the involvement of the household in various roles and activities of the CF establishment and development. The complete household survey questionnaire is presented in Appendix A.

### 5.6.2 Survey of the Executive Committees of the CFUGs

This survey was conducted specifically to gather data about the CFUGs as whole. The main respondents for this survey were the key EC members including the chairperson, vice-chairperson, secretary and treasurer. As previously stated, it was hypothesised that the open periods of the forest for extraction of CF products determined the choices for distribution and production. Therefore, the number of days for extraction of CF, amount of distribution of CF products and the different parameters in the process of decision-making were the focus of the survey.

The CFUG questionnaire was divided into four sections. The first part sought general information about the CFUG, The EC members were asked about name, address of the CFUG and number of households in the rich, medium, poor and poorest categories in the CFUG. The data collected about the ethnic representation in the CFUG were number of elite caste, *Dalit* and *Janjati* households in the CFUG. The second part sought resources information. EC members were asked about the total area of the CF including timber area and grazing area, and forest types (pine, mixed and broadleaf). The third section covered the structure of the EC. The EC members were asked the occupation and education of the chairperson of the CFUG. They were also asked about the representation of EC members from various wellbeing and ethnic caste households in the CFUG and about the rules,

regulations and practices of the CFUG for benefit distribution from CF. The EC members were asked to provide information about the income and expenditure of the group. The main sources of CFUG income are the trading of timber, firewood and other forest products, both inside and outside the CFUG. The survey of the EC members of the CFUGs is presented in Appendix B.

Both CFUG and households interviews were conducted without significant problems. Most CFUG members who attended the interviews were willing to sacrifice 2.5 to 4 hours to be interviewed. In many interviews particularly at household level, the spouse and other members of household were also present and they had discussions with the interviewee before deciding the answer. The discussions produced more refined data before being noted on the questionnaire sheet.

## 5.7 Data from Secondary Sources

The data that could not be obtained directly from interviews were collected from various sources like the FECOFUN, DFO and LFP offices of *Baglung* District. This included for example, feed requirements per livestock unit data, fodder value in terms of Total Digestible Nutrient (TDN) and livestock productivity. The main sources of information were as follows:

- Coniferous, broadleaf and mixed forests for the selection of the CF were identified from the records available from FECOFUN, DFO and LFP of *Baglung* District.
- Landholding patterns within the selected area and *Baglung* district, particularly for agricultural crop production, were collected from (Gurung, 2005) for comparison with the information from the research site.
- Household wellbeing categories were obtained from the research site and data compared and verified with Malla (2000).
- The fodder and feed requirements per livestock number; the livestock types were benchmarked as livestock units by using conversion factors such as cattle (0.5), buffalo (0.5) and sheep/goats (0.20) (Food & Agriculture Organisation, 2005; Sekhar, 1998). Fodder and crop residues are the main feed of these animals. The nutritive values of these residues vary. The fodder values are in terms of TDN. The Master Plan of the Forestry Sector (1989) explained the crop residues' productivity, their nutritive values and information on livestock feed requirements. Tree fodder productivity data were collected for this study.

- Timber and firewood productivity information.

## 5.8 Data Description

As described above, data were from main three sources: (a) the household survey; (b) the survey of the ECs of CFUGs; and (c) from secondary sources. The main purpose of this section is to summarise key information from the surveys provide an overview of CFUGs in the study, and to explore how the data links to the study objectives. This includes the leadership composition of EC, the effect of EC structure on the distribution rules of CF products.

### 5.8.1 Household Classification

Wellbeing and income categories are used to classify households. Wellbeing is a measure of the broader social and economic status of households in in a community and contains elements of social and economic indicators. Most household members in a CFUG are ranked in terms of wellbeing through a participatory approach. In a participatory wellbeing ranking process, a CFUG member who participates is ranked into a wellbeing category based on socioeconomic factors. The staff of bilateral projects like the Livelihood and Forestry Programme (LFP), NGOs, CBOs, District Forest teams and the FECOFUN work as facilitators to inform all the participants about the wellbeing ranking, its objective and usefulness to conduct the wellbeing ranking of the group. The leading socioeconomic and social status factors selected for wellbeing ranking were more or less same in each CFUG. The factors determining the household categories were landholding size, sufficiency of food grains, livestock holdings, education level of household family members, employment in public service, NGO service, remittance from overseas and India, family size, off-farm income, and physical properties such as house, machinery, tractors, buses, taxis and trucks ownership. This categorisation of wellbeing ranking by wealth and social status through the participatory approach is well recognised in rural development projects and most government line agencies, and NGOs have replicated it in their own initiatives (Malla, et al., 2005; Sollis, 1992) .

However, in rural Nepal, the identification of the wellbeing category is still a subjective and onerous process (National Planning Commission, 2006, 2007). A rich household in one community may be poor in another community and a woman belonging to a high income household may have a higher workload than a woman in a household with a low income

(Dhakal, 2006). Details of what constitute rich, medium, poor and poorest households are outlined below:

**Rich:** In this category, households have houses made of bricks, some livestock, at least one member of the family in a public job, engaged in business or with some other secure off-farm income, able to lend money to the others and having a lot of trees on their own land. They have the capacity to use mechanised tools for agricultural production. Those who earn off-farm income are mainly in government service, teachers, persons working abroad and servicemen in the Indian, Brunei or British armies. They all have a communication device including mobile phones, radios, televisions, digital cameras, movie cameras or cassette players.

**Medium:** These households have medium-size houses built with slate, tin and second class brick. They have their own agricultural land and employ farm labour. They have the capability to use chemical fertilizer and improved seeds as a semi-mechanised farmers. They have medium off-farm income or a small business, and are able to send their children to a medium type of school and college. They have 3 to 4 livestock. They may have some type of communication accessories such as digital cameras, video cameras or televisions.

**Poor:** Mostly illiterate or with limited access to education. They have medium-sized thatched houses. Most have poor quality, small land holdings, and 1 to 2 livestock. They cultivate other farmer's land on a sharing basis. They are mostly engaged as wage labourers by rich and elite farmers and send their children to local government schools. They have no trees on their farm and rely on the CF for their basic forest product needs. They usually do not have any communication devices except a radio.

**Poorest:** They have insufficient livestock and land for their basic needs. They have no other source of income. They have to work as daily wage labourers for rich and medium households. They are unable to send their children to school. Almost all have no trees on their own farmland and they depend on the CF for their basic forest product needs. They do not have any communication device.

The average wellbeing of the households of 31 CFUGs are presented in Figure 5.2. On average, rich households were 22%, medium 43%, poor 28% and poorest 9% in the CFUGs of the surveyed area. There were 37% of households in the poor and poorest categories that

represented a large proportion of the CFUGs. National data show that these categories of wellbeing households are 41.8% nationally (World Bank, 2008). Thus there is a lower percentage of poor and poorest households in surveyed area compared with the national level.

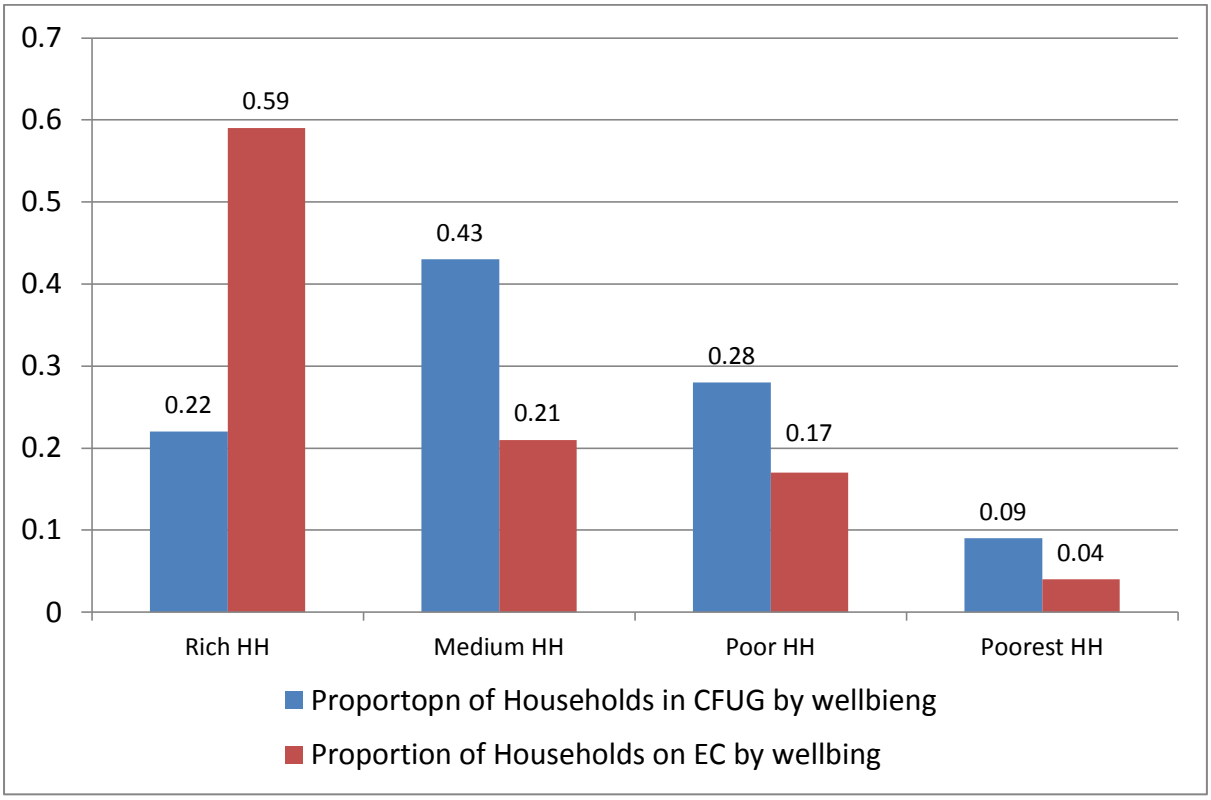


Figure 5.2 Average proportion of households by wellbeing on CFUG and EC in 31 CFUGs in the sampled area

The average percentage of households represented on the EC from the categories were rich 59%, medium 21%, poor 17% and poorest 4%. This result indicates that rich households were considerably over represented on the ECs of CFUGs compared with the same categories representation in the communities. The medium, poor and poorest households were under represented on the ECs of CFUGs.

### 5.8.2 Food sufficiency

For this thesis another measure of wealth is food sufficiency. This was categorized on the basis of food production from farmer's own land in a year.

**Over 12 month food sufficiency with surplus:** This category refers to households having sufficient food for over 12 month, with a surplus that can be sold and 20 to 30 *Ropani*[10] of good quality of their own farm land including *khet* and *Bari.*

**12 month food sufficiency:** Sufficient food for 12 months, ~~and~~ some surplus that may be used to buy other household needs, and 10 to 20 *Ropani* of their own farmland.

**9 month food sufficiency:** Household with sufficient food for 9 months from own farmland, and 7 to 10 *Ropani* of their own farmland.

**6 month food sufficiency:** Sufficient for 6 months, and 5 to 10 *Ropani* of their own farmland.

**3 month food sufficiency:** Sufficient food for 3 months or less, and with less than 5 *Ropani* of farmland or landless.

### 5.8.3 Caste and ethnicity

Community social structure is highly heterogeneous in terms of ethnicity and caste. The main ethnic castes are *Brahmin, Chettri, Thakuri, Newar, Magar, Kami, Sarki, Pariyar* and *Majhi. Majhi* are indigenous people living around the *Baglung* municipality of the *Ramrekha* Community Forestry Users' area. The *Majhi* is the least socio-economically developed ethnic group in the research area. Most are illiterate. They have neither registered land nor cattle. However, they have small huts on non-registered land, usually around the *Ramrekha* CF. They spend much of their time fishing in the *Kaligandaki* River, collecting vegetables, and working for others as labourers.

The average representation of ethnic caste households at the CFUGs and EC levels are presented on Figure 5.3. The representation of elite caste, *Janjati* and *Dalit* households were 67%, 16% and 17%, respectively, at the communities level but elite caste households were 79%, *Janjati* 10 % and *Dalit* 11% on the ECs of CFUGs. This finding indicates that elite caste households were over-represented on the EC compared with *Janjati* and *Dalit* households.

10. 20 Ropani is equal to 1 hectare

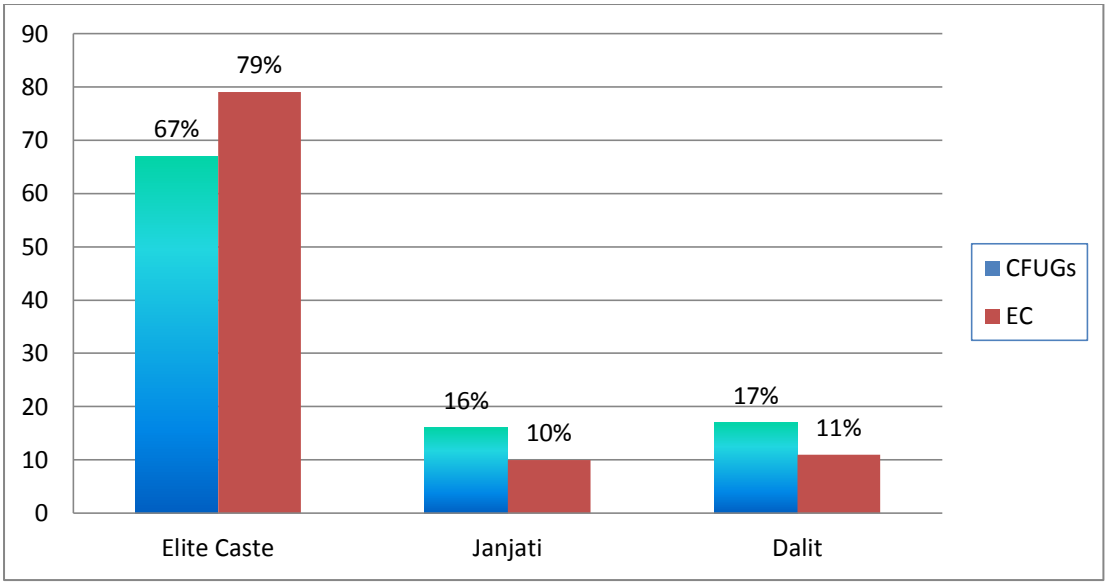


Figure 5.3 Average percent of ethnic caste household at CFUGs and EC level

### 5.8.4 CFUG Data

CF products of timber, firewood, fodder and leaf litter are very important products for households for their basic needs. The CF area (ha), amount of timber (cft), amount of firewood (*Bhari*[11)] and Leaf litter (*Bhari*) distributed by the CFUG are shown in Table 5.1. As can be seen in Table 5.1, 10 CFUGs had less than 10 ha of CF, 7 CFUGs had between 10 and 20 ha, 6 CFUGs had between 21 and 30 ha, 6 CFUGs had between 31 and 75 ha, 2 CFUGs had more than 75 ha of CF. Table 5.1 shows that many CFUGs produce no timber while others produced a large amount. For example, one CFUG with 8.70 ha of CF extracted 650 cft for distribution whereas another CF with an area of 291 ha had extracted 552 cft of timber. It is also apparent that the CF area is not the sole reason for the extraction of timber.

Several factors affect the harvesting of timber, firewood, fodder and leaf litter. The experience of the researcher as a District Forest Officer shows that extraction of timber is based on the condition of the forest. *Malukapatal* CFUG has juvenile forest whereas *Mauribhid* has a mature forest. Similarly, firewood collection is also based up on the type of species, condition of forest and the demand by the local households. For example, *Chhaharedhara Kailampokhari Baglung* CFUG has only 5.54 ha of CF but collected 1000 *Bhari* of firewood while *Sunakhari* had 75.75 ha of CF but collected only 700 *Bhari* of firewood. Comparing the amount collected of those two CFUGs, *Chhaharedhara Kailampokhari* CFUG had 180 *Bhari* per ha and *Sunakhari* 9.24 Bhari per ha.

11 Bhari 1=40kg

As observed by the researcher, the CF of *Sunakhari* had a forest with *Pinus wallichiana* whereas *Chhaharedhara Kailampokhari* had a bushy and mixed plantation forest with broadleaf species that could provide higher amounts of firewood.

Table 5.1 The distributed amount of CF product by CFUGs in the sampled area

| Sn | CFUG name | Area (ha) | Forest type | Amount of timber(cft) | Amount of Firewood(Bhari) | Amount of Fodder (Bhari) | Amount of Leaf litter (Bhari) |
|---|---|---|---|---|---|---|---|
| 12 | Dhursheni Baglung 10 | 2.34 | Broadleaf | 0.00 | 20.00 | 0.00 | 1550.51 |
| 9 | Jhangali Baglung 9 | 3.00 | Conifer | 0.00 | 0.00 | 137.21 | 357.51 |
| 11 | Chutreni Baglung 11 | 5.10 | Mixed | 0.00 | 30.00 | 0.00 | 235.10 |
| 28 | Chhaharedhara Kailampokhari Baglung 4 | 5.54 | Mixed | 0.00 | 1000.00 | 0.00 | 250.28 |
| 26 | Chitepani Baglung 9 | 6.32 | Mixed | 0.00 | 234.00 | 0.00 | 125.72 |
| 3 | Bhimara Sigana 3,4 | 6.50 | Conifer | 0.00 | 5227.50 | 0.00 | 196.14 |
| 19 | Dhandh Malika 2,3 | 6.75 | Conifer | 0.00 | 250.00 | 283.50 | 362.97 |
| 15 | Kuledanda Bhakunde 8 | 7.37 | Mixed | 0.00 | 530.00 | 0.00 | 713.80 |
| 10 | Bancharedunga Baglung 9 | 8.25 | Conifer | 0.00 | 120.00 | 0.00 | 1068.00 |
| 23 | Mauribhid Malika 5 | 8.70 | Conifer | 650.00 | 550.00 | 59.45 | 497.20 |
| 2 | Doyapragasti | 10.50 | Conifer | 500.00 | 500.00 | 0.00 | 143.33 |
| 14 | Gobneri Painyopata 6 | 11.17 | Broadleaf | 0.00 | 315.00 | 0.00 | 110.63 |
| 4 | Chamere Tityang, 5 | 12.30 | Mixed | 0.00 | 312.00 | 0.00 | 0.00 |
| 6 | Simal pata Titang 6,7,9 | 15.89 | Mixed | 86.00 | 840.00 | 53.46 | 215.60 |
| 21 | Slyanipakha, Malika 1,3,4 | 16.75 | Mixed | 170.00 | 1350.00 | 0.00 | 580.08 |
| 7 | Chhipchhipepale Baglung 11 | 17.60 | Broadleaf | 0.00 | 564.00 | 856.98 | 26.79 |
| 22 | Chyangrekharga Baglung 8 | 18.71 | Mixed | 1200.00 | 120.00 | 0.00 | 248.72 |
| 5 | Bhagawat ChisapaniTitang 1 | 21.10 | Broadleaf | 0.00 | 121.00 | 0.00 | 363.99 |
| 31 | Jograni Painyopata 3 | 22.50 | Broadleaf | 100.00 | 450.00 | 0.00 | 540.50 |
| 30 | Shakhinichaur Paiyopata 2 | 22.75 | Conifer | 0.00 | 220.00 | 0.00 | 280.22 |
| 16 | Rani bhumi Sigana 1 2 3 | 25.50 | Broadleaf | 500.00 | 1100.00 | 0.00 | 165.20 |
| 13 | Dhoreni Baglung 10,11 | 28.23 | Conifer | 0.00 | 760.00 | 0.00 | 470.00 |
| 1 | Byaldhara Baglung 7 | 29.72 | Conifer | 0.00 | 0.00 | 232.15 | 499.50 |
| 8 | Daha Bhakunde 6,7 | 36.24 | Mixed | 90.00 | 1500.00 | 0.00 | 2245.03 |
| 25 | Ramrekha Baglung 1 | 41.00 | Mixed | 0.00 | 1325.00 | 361.26 | 1601.90 |
| 27 | ReshBuchhung salleri Resh 3 | 46.06 | Mixed | 283.00 | 250.00 | 518.40 | 829.42 |
| 29 | Dhadhkarka Bhakunde 9 | 49.00 | Mixed | 30.00 | 435.00 | 283.50 | 92.71 |
| 20 | Titaure Palakot 7-9 | 74.73 | Conifer | 800.00 | 220.00 | 0.00 | 1286.31 |
| 24 | Sunakhari Malika 7,8,9 | 75.75 | Conifer | 5000.00 | 700.00 | 243.00 | 371.80 |
| 18 | SanghukholaRatopahara Resh 3,4 | 141.00 | Broadleaf | 402.00 | 1389.00 | 189.05 | 718.20 |
| 17 | Malukapatal Resh 1, 2 | 291.15 | conifer | 552.00 | 3547.00 | 226.80 | 1452.10 |
| | Average | 34.44 | | 334.29 | 773.53 | 111.12 | 586.64 |
| | Maximum | 291.15 | | 5000.00 | 5227.50 | 856.98 | 2245.03 |
| | Minimum | 2.34 | | 0.00 | 0.00 | 0.00 | 26.79 |

Source: CFUG data

The broadleaf forest of *Chhipchhipepale Baglung* CFUG of 17.60 ha produced 857 *Bhari* of fodder whereas *Malukapatal* with 291.15 ha of forest collected only 227 *Bhari* of fodder. The possible reason is that the broadleaf forest contains more fodder species suitable for fodder collection compared with conifer forest in other CFs. The collection of leaf litter also depends on whether the forest is conifer or broadleaf. It appears that a broadleaf forest could produce higher amounts of leaf litter than conifer forest. For example, *Dhursheni Baglung* had 2.34 ha of broadleaf forest, the lowest area of the surveyed CFs, but 1550 *Bhari* of leaf litter was collected. This amount of leaf litter is considerably higher than 29 CFUGs that had a higher forest area.

### 5.8.5 Income of CFUG

The CFUG income obtained from the CF is one of the main attractions for the management and utilisation of forests by CFUGs. The main sources of income from the CF are selling firewood, timber, fodder and leaf litter. They also obtain income from the levy on households that are involved in the utilisation of the forest. The CFUGs that had higher income were able to operate several development activities, such as drinking water schemes, small tracks/roads, support to schools and other activities for enhancing the livelihood of the poor and disadvantaged households. Figure 5.4 shows the income per household of CFUGs in the survey compared to forest area per household.

Out of 31 CFUGs, 30 CFUG received income from the distribution and selling of forest products. Of these 30 CFUGs, 5 CFUGs are removed from the Figure 5.4 because of either very large area or high income per household. These of the CFUGs were located close to the headquarter area and earned significant timber income. The forests with large area have degraded forest. So they have very small income from selling of forest products. For example, CFUGs with 0.10 ha area per household has income per household ranging from at least nothing to 70.00 USD[12]. Figure 5.4 shows that there is weak relation between area per household and income per ha. When area per household increases generally the income per household also increases.

12. NPR 72.00 is equal to USD 1

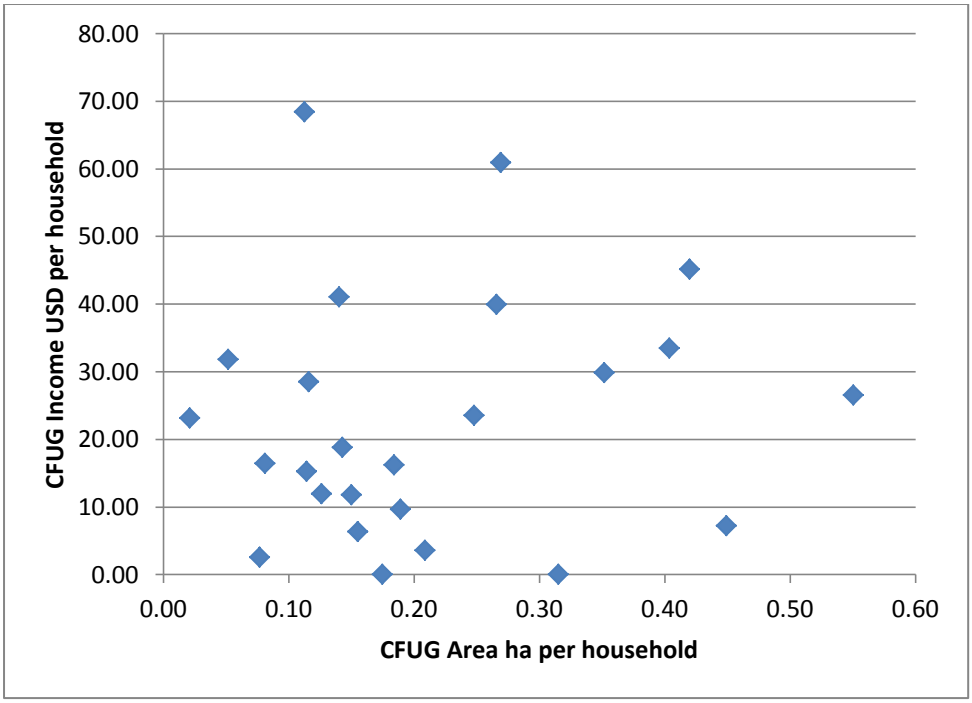


Figure 5.4 Total Income of the Surveyed CFUGs from CF

## 5.9 Chapter Summary

This chapter has presented the reasons for selecting the *Baglung* district, gives an overview of the research site and the household survey and describes the instruments and data used. *Baglung* district is one of the middle hill districts of Nepal where the CF programme has been conducted since 1991. The survey instruments used were a survey of household heads, a survey of the members of the EC and secondary sources. The household survey included information about household attributes and private endowments. The households were selected as representative of community social structures, ethnic caste composition and income group. The factors determining the segregation of households were landholding size, sufficiency of food grains, livestock holding, occupation of household head, household size, employment in public or I/NGO, remittances from overseas and India, off-farm income, physical properties such as house, machinery, tractors buses, trucks and social status gained due to wealth and ethnic status. Data about the rich, medium, poor and poorest households were also collected. Household data were randomly collected from 10 households in each CFUG representing rich, medium, poor and poorest households. There were 310 household surveyed from 31 CFUGs. The respondents were asked about the past and present representation of EC members from households in the CFUG and NGO membership. The EC members were also asked about the total income of the CFUGs obtained from selling CF

products and other sources like levies, donations and the punishment of members who collected CF products against the rules of the CFUG. This data provides the basis for an analysis of the research hypotheses.

# Chapter 6
# ATTRIBUTES OF LEADERSHIP

## 6.1 Introduction

The household attributes determining leadership in CFUGs are presented in this chapter. It is hypothesized that the social structural characteristics of households determine the probability of a household member being in a leadership position. To evaluate this hypothesis a selection of household attributes was analysed. The results are divided into two sections. The first section provides the descriptive statistics of the surveyed households and CFUGs. The purpose of this section is to assist in the selection of variables for the regression analysis. The descriptive statistics include landholding size, income, food sufficiency category and livestock units. The results of the logistic binary regression for the selection of leadership are presented in the second section. This model was described in Chapter 4 (equation 4.1). Different attributes of households are used as the explanatory variables.

## 6.2 Descriptive Statistics

The data relating to leadership are described in this section. The results are given as simple summaries in the form of tables and graphs along with t-tests for statistical difference. A descriptive statistical method is also used to examine the data for variables suitable to use in the logistic regression model. Two aspects of the household's economic and social attributes are studied to identify whether they are correlated with the selection of leaders.

In terms of economic attributes**,** the income and wealth of households are believed to influence the selection of EC members of CFUGs. The economic criteria are food sufficiency, landholding, livestock holding and off-farm income, including remittances from foreign countries such as serving in the British and Indian armies, income from public service and from other sources. Food sufficiency is divided into five categories: over 12 months food sufficiency, 12 months food sufficiency, 9 months food sufficiency, 6 months food sufficiency and 3 months and less food sufficiency.

The social attributes considered are wellbeing (income class), ethnic caste group and NGO membership. The ethnic castes include elite (high caste), *Dalit* (lower and untouchable caste) and *Janjati* (middle caste). The hypothesis is that the elite are more likely to be represented

on the EC whereas the *Dalit* and *Janjati* groups will have a lower representation on the ECs. The wealth related variables considered in this category are locally-determined "wellbeing" categories in which households are categorised as rich, medium, poor and poorest. The hypothesis is that a rich household member is more likely to be selected as an EC member. Another variable is whether households have an NGO member, which is based on the belief that households with an NGO member are more likely to be selected as EC members. The hypothesis is that if poor and lower castes are empowered by NGOs through training, study tours and workshops about their rights, there may be increased representation of those people on the EC.

### 6.2.1 Leadership and Wellbeing Category

Table 6.1 shows the percentage of households by wellbeing category and on the EC in each CFUG. The CFUG level data show the distribution of different households by wellbeing categories as determined by the CFUG. In the *Shakhinichaur Paiyopata* CFUG, 68% of households are classed as being rich, which is the highest of the 31 surveyed CFUGs. As observed by the researcher, the reason for the high proportion of rich households is because *Shakhinichaur Paiyopata* is located a short distance from the *Baglung* and *Parpat* district headquarters. This produces a community with more opportunity to conduct business including selling farm products in a market.

The first seven CFUGs with a high proportion of rich households are located around the headquarters of *Baglung.* These communities have more opportunity to access markets. The next 10 CFUGs are in valley areas where there is plain land cultivated for agricultural products but which are further from markets. As a consequence, these communities have a large proportion of medium income households. The remaining 13 CFUGs are generally located in remote areas where there is limited ability to produce agricultural products because of steeper slopes, which are less suitable for agriculture, as well as the difficulty in accessing markets. This accounts for the higher proportion of poor households in these CFUGs.

Table 6.1 The relative proportion of Nepalese households at the CFUG and EC level by wellbeing category

| Sn | CFUG name | Proportion of Households by wellbeing | | | | Proportion of households on EC by wellbeing | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | RichHh (%) | MedHh (%) | Poor Hh (%) | PoorestHh (%) | RichHh % | MedHh% | PoorHh % | PoorestHh % |
| 30 | Shakinichaur, Paiyopata 2 | 0.68 | 0.14 | 0.15 | 0.02 | 0.70 | 0.00 | 0.30 | 0.00 |
| 21 | Slyanipakha, Malika 1,2,3 | 0.47 | 0.26 | 0.22 | 0.04 | 0.70 | 0.00 | 0.30 | 0.00 |
| 2 | Doyapragati | 0.44 | 0.24 | 0.28 | 0.00 | 0.70 | 0.20 | 0.10 | 0.00 |
| 9 | Jhangali, Baglung 9 | 0.44 | 0.23 | 0.21 | 0.13 | 0.60 | 0.20 | 0.20 | 0.00 |
| 3 | Bhimara, Sigana | 0.43 | 0.36 | 0.20 | 0.00 | 0.30 | 0.40 | 0.30 | 0.00 |
| 15 | Kuledanda Bhakunde 8 | 0.33 | 0.55 | 0.10 | 0.02 | 0.50 | 0.20 | 0.30 | 0.00 |
| 8 | Daha, Bhakunde 6,7 | 0.33 | 0.22 | 0.24 | 0.21 | 0.60 | 0.20 | 0.20 | 0.00 |
| 7 | Chhipchhipepale Baglung 11 | 0.32 | 0.42 | 0.10 | 0.16 | 0.90 | 0.00 | 0.00 | 0.10 |
| 14 | Gobneri,Paiyopata 6 | 0.26 | 0.47 | 0.26 | 0.00 | 0.70 | 0.20 | 0.10 | 0.00 |
| 1 | Byaldhara Baglung 7 | 0.26 | 0.61 | 0.13 | 0.00 | 0.60 | 0.40 | 0.00 | 0.00 |
| 29 | Dhadhakarka Bhakunde 9 | 0.23 | 0.48 | 0.28 | 0.00 | 0.80 | 0.00 | 0.20 | 0.00 |
| 12 | Dhursheni Baglung 10 | 0.23 | 0.45 | 0.27 | 0.05 | 0.60 | 0.30 | 0.00 | 0.10 |
| 31 | Jograni Paiyopata 3 | 0.20 | 0.65 | 0.11 | 0.04 | 1.00 | 0.00 | 0.00 | 0.00 |
| 11 | Chutreni Baglung 11 | 0.19 | 0.29 | 0.35 | 0.16 | 0.40 | 0.30 | 0.20 | 0.10 |
| 18 | Sanghukhola Rato Resh 3, 4 | 0.18 | 0.65 | 0.14 | 0.02 | 0.50 | 0.20 | 0.30 | 0.00 |
| 23 | Mauribhid Malika 5 | 0.18 | 0.55 | 0.18 | 0.18 | 0.60 | 0.30 | 0.10 | 0.00 |
| 20 | Tittaure Palakot 7, 8,9 | 0.18 | 0.25 | 0.54 | 0.03 | 0.40 | 0.40 | 0.10 | 0.10 |
| 17 | Malukapatal Resh 1,2 | 0.18 | 0.20 | 0.55 | 0.07 | 0.20 | 0.50 | 0.30 | 0.00 |
| 10 | Bancharedhunga Baglung 9 | 0.15 | 0.19 | 0.63 | 0.03 | 0.60 | 0.20 | 0.10 | 0.10 |
| 5 | Bhagwati Chisapani,Titang 1 | 0.13 | 0.76 | 0.08 | 0.03 | 0.80 | 0.10 | 0.10 | 0.00 |
| 4 | Chamere Titang 5 | 0.13 | 0.36 | 0.38 | 0.13 | 0.60 | 0.20 | 0.10 | 0.10 |
| 6 | Simal Pata Titang, 6,7,9 | 0.12 | 0.73 | 0.12 | 0.03 | 0.50 | 0.40 | 0.10 | 0.00 |
| 19 | Dhandha Malika 2,3 | 0.10 | 0.33 | 0.45 | 0.12 | 0.20 | 0.60 | 0.10 | 0.10 |
| 22 | ChyangreKharga Baglung,8 | 0.09 | 0.30 | 0.35 | 0.26 | 0.70 | 0.00 | 0.20 | 0.10 |
| 16 | Ranibhumi, Sigana, 1,2,3 | 0.09 | 0.32 | 0.47 | 0.09 | 0.70 | 0.00 | 0.20 | 0.10 |
| 13 | Dhoreni Baglung 10,11 | 0.08 | 0.27 | 0.56 | 0.04 | 0.90 | 0.00 | 0.10 | 0.00 |
| 26 | Chitepani baglung 9 | 0.08 | 0.17 | 0.41 | 0.35 | 0.10 | 0.40 | 0.40 | 0.10 |
| 24 | Sunakhari,Malika 7,8,9 | 0.07 | 0.65 | 0.21 | 0.04 | 0.60 | 0.20 | 0.20 | 0.00 |
| 25 | Ramrekha, Baglung 1 | 0.07 | 0.55 | 0.15 | 0.22 | 0.70 | 0.20 | 0.00 | 0.10 |
| 28 | Chhaharedhara, Baglung 4 | 0.05 | 0.81 | 0.02 | 0.12 | 0.70 | 0.00 | 0.30 | 0.00 |
| 27 | Reshbuchung, Salleri | 0.02 | 0.63 | 0.35 | 0.00 | 0.60 | 0.20 | 0.20 | 0.00 |
| | Maximum | 0.68 | 0.81 | 0.63 | 0.35 | 1.00 | 0.60 | 0.40 | 0.10 |
| | Minimum | 0.02 | 0.14 | 0.02 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 |
| | Average | 0.22 | 0.43 | 0.28 | 0.09 | 0.59 | 0.21 | 0.17 | 0.04 |

Table 6.1 also shows the representation on the current EC of each CFUG by wellbeing category. The rich household group constitutes 22% of CFUG households on average, but about 59% of the membership of the EC. The medium household group constitutes 43% of the CFUG households, on average, but represents only 21% of the membership of the EC. The poor household group constitutes 28% of the CFUG households, on average, and 17% of the membership of the EC. The poorest household group constitutes 9% of the CFUG households, on average, but only 4% of the membership of the EC. The results indicate that rich households are over represented in CFUG leadership and the other groups are generally under represented.

In order to evaluate whether the wellbeing attributes of a household may be one factor in the selection of leaders, a two sample t-test assuming unequal variances was conducted to analyse whether the mean of these wellbeing groups is statistically different between each set of wellbeing groups. Table 6.2 shows the results for the relationship between household wellbeing characteristics and leadership status by household category in each CFUG. The t-test analysis result shows that there is a significant negative difference between rich and medium households. The t-test values also show a significant positive difference between medium and poor, medium and poorest households. Hence, the overall results indicate that wellbeing category could be a suitable variable for the econometric analysis.

Table 6.2 The t-test ratio matrix of wellbeing and position on the Executive Committee of community forests in Nepal (N=310)

| Wellbeing category | Rich | Medium | Poor | Poorest | Critical two-tail value | | | Degrees of freedom | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rich | | | | | | | | | | |
| Medium | -3.38* | | | | 2 | | | 520 | | |
| Poor | -1.2 | 4.37* | | | 2 | 2 | | 510 | 560 | |
| Poorest | 1.92 | 6.65* | 2.15* | | 2 | 2 | 2 | 560 | 530 | 530 |

* Statistically significant. The critical two-tail value at 5% significance is 1.96.

Source: Household survey

### 6.2.2 Leadership and Ethnic Caste

It is believed that people belonging to elite caste households are more likely to be leaders of CFUGs. To test this, Table 6.3 compares the caste representation at the CFUG and EC levels. The relative representation of castes on the EC compared with the CFUG is one way to verify whether a caste was over, or under, represented. This is calculated as the proportion of a caste

on the EC divided by its proportion of the CFUG population. Table 6.3 shows the representation on the current EC of each CFUG by caste category. The elite caste household group constitutes 67% of CFUG households, on average, but about 79% of the membership of the EC. The *Dalit* household group constitutes 16% of the CFUG households, on average, but represents only 10% of the membership of the EC. The *Janjati* household group constitutes 17% of the CFUG households, on average, and 11% of the membership of the EC.

Table 6.3 also shows that the average relative representation of elite households on the EC is greater than representation in the community (1.27), whereas *Dalit* (0.43) and *Janjati* (0.40) are underrepresented. A value of 1 means that representation on the EC is proportionate to the share of the population, greater than 1 means over represented and less than 1 means under represented.

Table 6.3 The proportion of Nepalese households at the CFUGs and EC levels by ethnic caste

| | | Percent of households in CFUG | | | Percent of Households on EC | | | Relative Representation | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sn | CFUGs name | Elite | Dalit | Janjati | Elite | Dalit | Janjati | Elite | Dalit | Janjati |
| 1 | Byaldhara Baglung 7 | 0.80 | 0.20 | | 0.70 | 0.30 | | 0.88 | 1.50 | |
| 10 | Bancharedhunga Baglung 9 | 0.80 | 0.20 | | 0.70 | 0.30 | | 0.88 | 1.50 | |
| 24 | sunakhari,Malika 7,8,9 | 1.00 | | | 1.00 | | | 1.00 | | |
| 19 | Dhandha Malika 2,3 | 1.00 | | | 1.00 | | | 1.00 | | |
| 31 | Jograni Paiyopata 3 | 0.30 | | 0.70 | 0.30 | | 0.70 | 1.00 | | 1.00 |
| 11 | Chutreni Baglung 11 | 0.50 | 0.10 | 0.40 | 0.50 | 0.00 | 0.50 | 1.00 | 0.00 | 1.25 |
| 25 | Ramrekha, Baglung 1 | 1.00 | | | 1.00 | | | 1.00 | | |
| 23 | Mauribhid Malika 5 | 1.00 | | | 1.00 | | | 1.00 | | |
| 30 | Shakinichaur, Paiyopata 2 | 0.70 | 0.20 | 0.10 | 0.70 | 0.10 | 0.20 | 1.00 | 0.50 | 2.00 |
| 16 | Ranibhumi, Sigana, 1,2,3 | 1.00 | | | 1.00 | | | 1.00 | | |
| 5 | Bhagwati Chisapani,Titang 1 | 0.90 | | 0.10 | 1.00 | | 0.00 | 1.11 | | 0.00 |
| 3 | Bhimara, Sigana | 0.90 | | 0.10 | 1.00 | | 0.00 | 1.11 | | 0.00 |
| 29 | Dhadhakarka Bhakunde 9 | 0.80 | 0.20 | | 0.90 | 0.10 | | 1.13 | 0.50 | |
| 7 | Chhipchhipepale Baglung 11 | 0.80 | 0.20 | | 0.90 | 0.10 | | 1.13 | 0.50 | |
| 28 | Chhaharedhara, Baglung 4 | 0.70 | 0.20 | 0.10 | 0.80 | 0.00 | 0.20 | 1.14 | 0.00 | 2.00 |
| 27 | Reshbuchung, Salleri | 0.60 | 0.40 | | 0.70 | 0.30 | | 1.17 | 0.75 | |
| 15 | Kuledanda Bhakunde 8 | 0.50 | 0.50 | | 0.60 | 0.40 | | 1.20 | 0.80 | |
| 4 | Chamere Titang 5 | 0.50 | 0.40 | 0.10 | 0.60 | 0.30 | 0.10 | 1.20 | 0.75 | 1.00 |
| 2 | Doyapragati | 0.70 | 0.30 | | 0.90 | 0.10 | | 1.29 | 0.33 | |
| 18 | Sanghukhola Rato Resh 3, 4 | 0.70 | 0.30 | | 0.90 | 0.10 | | 1.29 | 0.33 | |
| 9 | Jhangali, Baglung 9 | 0.70 | | 0.30 | 0.90 | | 0.10 | 1.29 | | 0.33 |
| 21 | Slyanipakha, Malika 1,2,3 | 0.70 | 0.30 | | 0.90 | 0.10 | | 1.29 | 0.33 | |
| 8 | Daha, Bhakunde 6,7 | 0.60 | 0.30 | 0.10 | 0.80 | 0.10 | 0.10 | 1.33 | 0.33 | 1.00 |
| 6 | Simal Pata Titang, 6,7,9 | 0.60 | 0.30 | 0.10 | 0.80 | 0.00 | 0.20 | 1.33 | 0.00 | 2.00 |
| 13 | Dhoreni Baglung 10,11 | 0.60 | 0.10 | 0.30 | 0.80 | 0.10 | 0.10 | 1.33 | 1.00 | 0.33 |
| 14 | Gobneri,Paiyopata 6 | 0.60 | 0.40 | | 0.90 | 0.10 | | 1.50 | 0.25 | |
| 22 | ChyangreKharga Baglung,8 | 0.50 | 0.10 | 0.40 | 0.80 | 0.10 | 0.10 | 1.60 | 1.00 | 0.25 |
| 17 | Malukapatal Resh 1,2 | 0.60 | | 0.40 | 1.00 | | 0.00 | 1.67 | | 0.00 |
| 12 | Dhursheni Baglung 10 | 0.40 | 0.10 | 0.50 | 0.70 | 0.20 | 0.10 | 1.75 | 2.00 | 0.20 |
| 26 | Chitepani baglung 9 | 0.40 | 0.10 | 0.50 | 0.70 | 0.10 | 0.20 | 1.75 | 1.00 | 0.40 |
| 20 | Tittaure Palakot 7, 8,9 | 0.10 | | 0.90 | 0.30 | | 0.70 | 3.00 | | 0.78 |
| | Average proportion (%) | 0.67 | 0.16 | 0.17 | 0.79 | 0.10 | 0.11 | 1.27 | 0.43 | 0.40 |

Source: Household survey

It can be seen that, generally, the elite caste is never underrepresented on the EC. The relative representation of elite caste households is 1.27, which is much higher than *Dalit* caste households at 0.43 and *Janjati* caste household at EC 0.40.

To examine whether caste-based representation on the EC is statistically different, a t-test assuming unequal variances was conducted. Table 6.4 shows that the t statistic value is greater than the critical two tail value for the elite, *Dalit* and *Janjati* castes, which indicates that the elite castes are statistically positively different from the *Dalit* and *Janjati* castes and *Janjati* is negatively different from the *Dalit*. This shows that caste could be a suitable variable for econometric analysis.

Table 6.4 The t statistics of the ratio of ethnic caste representation on EC of CFUGs

| t-Test: two-sample assuming unequal variances for ratio of ethnic caste | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ElitHh | Dalit | Janjati | Critical two-tail values | | DF | | Numbers of Observation | | | |
| Elite | | | | | | | | | | | |
| Dalit | 4.26* | | | 1.96 | | 429 | | 310 | 310 | | |
| Janjati | 4.43* | -3.99* | | 1.96 | 1.96 | 616 | 444 | 310 | 310 | 310 | 310 |

* Statistically significant, critical two-tail value at the 5% significance level is 1.96.

The results indicate that with many castes or ethnic groups in a community, the poor have to overcome issues related to their caste as well as wealth, meaning the organisational elite model B (Figure3.1) becomes important. When the poor are of the same caste as the rich, then the only issues they have to overcome to participate on the EC is their wealth status, meaning the organisational elite model A (Figure 3.1) becomes important.

### 6.2.3 Food Sufficiency

Most households in rural areas depend on agricultural products they produce themselves, particularly for food. Access to food is a key factor in becoming involved in social activities including leadership at the local level, especially in the hill and mountain districts. Households with food sufficiency of more than 9 months in a year have high social prestige and are consistently more represented in decision-making units of CF than the low food sufficiency households (Adhikari & Di-Falco, 2009; J. R. Campbell, 2005). In order to evaluate whether food sufficiency may be one of the attributes for leadership selection, households surveyed in each CFUG were asked about their food sufficiency status and whether they currently held, or had at any time in the past held, leadership positions on the

EC. Table 6.5 shows the proportion of households surveyed in each CFUG by food sufficiency category and EC leadership position.

The proportion of EC members in each food sufficiency category was calculated by dividing the total number of EC members in the each food sufficiency category by the total number of households surveyed in that food sufficiency category. On average, households with a food surplus and 12 month food sufficiency have a higher representation in EC than others. Care must be taken in interpreting too much more into this result, since it is developed from a stratified random sample in each CFUG rather than being based on a sample of all households in a CFUG. As discussed in Chapter 5, 10 households covering different wealth categories were interviewed in each CFUG.

Table 6.5 EC membership and food sufficiency of Nepalese households

| | CFUG Name | Food Surplus | | | 12month Sufficiency | | | 9month Sufficiency | | | 6 month Sufficiency | | | 3 month Sufficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sn | CFUG name | EC member | Total HH | % EC member | EC member | Total HH | % member | EC member | Total HH | % EC member | EC member | Total HH | % EC member | EC Member | Total HH | % EC member |
| 1 | Byaldhara Baglung Municipality 7 | 3 | 3 | 1.00 | 2 | 2 | 1.00 | | | | 1 | 5 | 0.20 | 0 | 0 | |
| 2 | Doyapragasti | 0 | 1 | 0.00 | 3 | 3 | 1.00 | | | | 2 | 3 | 0.67 | 2 | 3 | 0.67 |
| 3 | Bhimara Sigana | | | | 6 | 6 | 1.00 | | | | 1 | 3 | 0.33 | 0 | 1 | 0.00 |
| 4 | Chamere Tityang, 5 | 3 | 3 | 1.00 | 1 | 1 | 1.00 | | | | 4 | 5 | 0.80 | 0 | 1 | 0.00 |
| 5 | Bhagawat ChisapaniTitang 1 | | | | | | | | | | 2 | 3 | 0.67 | 1 | 7 | 0.14 |
| 6 | Simal pata Titang 6,7,9 | 1 | 1 | 1.00 | 0 | 1 | 0.00 | | | | 2 | 4 | 0.50 | 1 | 4 | 0.25 |
| 7 | Chhipchhipepale Baglung 11 | | | | | | | | | | 2 | 6 | 0.33 | 2 | 4 | 0.50 |
| 8 | Daha Bhakunde 6,7 | 1 | 1 | 1.00 | 1 | 2 | 0.50 | 1 | 1 | 1.00 | 2 | 4 | 0.50 | 1 | 2 | 0.50 |
| 9 | Jhangali Baglung 9 | 1 | 2 | 0.50 | 1 | 1 | 1.00 | 0 | 1 | 0.00 | 2 | 3 | 0.67 | 1 | 3 | 0.33 |
| 10 | Bancharedunga Baglung 9 | | | | 5 | 4 | 1.25 | | | | 2 | 5 | 0.40 | 0 | 1 | 0.00 |
| 11 | Chutreni Baglung 11 | 2 | 2 | 1.00 | 2 | 2 | 1.00 | | | | 1 | 1 | 1.00 | 3 | 5 | 0.60 |
| 12 | Dhursheni Baglungy 10 | 2 | 2 | 1.00 | | | | | | | 1 | 4 | 0.25 | 0 | 4 | 0.00 |
| 13 | Dhoreni Baglung 10,11 | 0 | 2 | 0.00 | | | | | | | 2 | 5 | 0.40 | 1 | 3 | 0.33 |
| 14 | Gobneri Painyopata 6 | 2 | 2 | 1.00 | 1 | 1 | 1.00 | | | | 1 | 4 | 0.25 | 1 | 3 | 0.33 |
| 15 | Kuledanda Bhakunde 8 | 1 | 1 | 1.00 | 1 | 1 | 1.00 | 0 | 2 | 0.00 | 0 | 1 | 0.00 | 1 | 5 | 0.20 |
| 16 | Rani bhumi Sigana 1 2 3 | 2 | 4 | 0.50 | 0 | 2 | 0.00 | | | | 0 | 1 | 0.00 | 1 | 3 | 0.33 |
| 17 | Malukapatal Resh 1, 2 | 3 | 3 | 1.00 | 0 | 1 | 0.00 | | | | 2 | 3 | 0.67 | 1 | 3 | 0.33 |
| 18 | SanghukholaRatopahara Resh 3,4 | 2 | 2 | 1.00 | 3 | 1 | 3.00 | 2 | 2 | 1.00 | 1 | 1 | 1.00 | 1 | 4 | 0.25 |
| 19 | Dhandh Malika 2,3 | 0 | 3 | 0.00 | 2 | 2 | 1.00 | | | | 1 | 2 | 0.50 | 3 | 3 | 1.00 |
| 20 | Titaure Palakot 7-9 | 2 | 2 | 1.00 | 2 | 3 | 0.67 | | | | 0 | 1 | 0.00 | 0 | 4 | 0.00 |
| 21 | Slyanipakha, Malika 1,3,4 | 2 | 3 | 0.67 | 2 | 3 | 0.67 | | | | | | | 1 | 4 | 0.25 |
| 22 | Chyangrekharga Baglung 8 | 0 | 3 | 0.00 | 0 | 1 | 0.00 | | | | 0 | 1 | 0.00 | 1 | 5 | 0.20 |
| 23 | Mauribhid Malika 5 | 0 | 1 | 0.00 | | | | | | | 1 | 3 | 0.33 | 3 | 6 | 0.50 |
| 24 | Sunakhari Malika 7,8,9 | 0 | 1 | 0.00 | 2 | 2 | 1.00 | | | | 0 | 1 | 0.00 | 1 | 6 | 0.17 |
| 25 | Ramrekha Baglung 1 | | | | 1 | 2 | 0.50 | | | | 2 | 3 | 0.67 | 0 | 5 | 0.00 |
| 26 | Chitepani Baglung 9 | 1 | 1 | 1.00 | 2 | 5 | 0.40 | | | | 2 | 2 | 1.00 | 1 | 2 | 0.50 |
| 27 | ReshBuchhung salleri | 1 | 3 | 0.33 | 2 | 2 | 1.00 | | | | 1 | 1 | 1.00 | 3 | 4 | 0.75 |
| 28 | Chhaharedhara Kailampokhari Baglung 4 | 1 | 4 | 0.25 | | | | | | | 1 | 2 | 0.50 | 2 | 4 | 0.50 |
| 29 | Dhadhkarka Bhakunde 9 | 2 | 3 | 0.67 | 1 | 1 | 1.00 | | | | 2 | 3 | 0.67 | 2 | 3 | 0.67 |
| 30 | Shakhinichaur Paiyopata 2 | 2 | 2 | 1.00 | 1 | 1 | 1.00 | | | | 3 | 4 | 0.75 | 2 | 3 | 0.67 |
| 31 | Jograni Painyopata 3 | 2 | 2 | 1.00 | | | | | | | 4 | 5 | 0.80 | 0 | 3 | 0.00 |
| | Total | 36 | 57 | 0.63 | 43 | 50 | 0.86 | 3 | 6 | 0.50 | 45 | 89 | 0.50 | 36 | 108 | 0.33 |

A two tail *t*-test, assuming unequal variances, was conducted to analyse whether the paired groups' means were statistically different. Table 6.6 shows the test results evaluated at the 5% significance level. The value of the t test statistic (t= 3.43) indicates that there is a significant difference between greater than 12 months and 12 months food sufficiency households and it is also more likely that they will be selected for CFUG leadership. Similarly, the t test value (t = 2.39) indicates that there is also a significant difference between greater than 12 months and 6 months food sufficiency category households. Likewise, the t-test (t =3.27) indicates that there is a statistically significant difference between the greater than 12 months and the 3 months food sufficiency category households. For the household groups having food sufficiency of 12 months and 9 months, the t value (t = 3.57) is significantly different. Similarly, the t value (t = 2.13) is statistically positively different between the 12 months and 3 months food sufficiency households. The t-statistic (t=3.27) between the food sufficiency categories 9 months and 6 months shows they are statistically significantly different. The above results indicate that the food sufficiency categories over 12 months, 12 months, 9 months 6 months and 3 months food sufficiency can be determining factors in terms of being selected as a leader in the CFUG. This requires further analysis in the econometric model.

Table 6.6 t-Test ratio matrix of for the food sufficiency category household representation at the EC level in Nepal (N 310)

| t-Test: Two-Sample Assuming Unequal Variances for food sufficiency | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Food sufficiency Category | >12m | 12m | 9m | 6m | 3m | Critical two-tail value | | | | Degree of Freedom | | | |
| >12m | | | | | | | | | | | | | |
| 12m | 3.43* | | | | | 1.96 | | | | 597 | | | |
| 9m | 0.49 | 3.57* | | | | 1.96 | 1.96 | | | 617 | 604 | | |
| 6m | 2.39* | 0.68 | 3.14* | | | 1.96 | 1.96 | 1.96 | | 601 | 618 | 607 | |
| 3m | 3.27* | 2.13* | 1.42 | 1.21 | | 1.96 | 1.96 | 1.96 | 1.96 | 609 | 615 | 607 | 617 |

* Statistically significant, critical two-tail value at the 5% significance level is 1.96.

### 6.2.3 Livestock Holdings

Livestock is one of the indicators of social power and CF is an important source of feed for livestock (Food & Agriculture Organisation, 2005; Sekhar, 1998). Therefore, livestock holdings could be a major economic variable in determining EC membership. Average livestock holdings by EC and non-EC households from the household survey data are presented in Table 6.7. On average, EC households had 3.4 livestock units and non-EC member households had 2.8 units, i.e., EC member households had higher numbers than non-EC member households.

The first 8 CFUGs in Table 6.7, which are located in remote areas, had less than one relative livestock unit to the EC member household. It means they have no good opportunity to sell their livestock unit, including milk, in their own village. The 16 CFUGs EC members average between 1.0 and 1.47 relative livestock units. They have no access to big markets but to small markets like townships at the centre of those CFUGs and they have higher opportunity to sell their livestock products than the former eight CFUGs. The five CFUGs are around *Baglung* Bazaar; the EC member households have a significant market opportunity to sell their livestock products thus those CFUGs have the opportunity to manage higher units of livestock. From the working experience of the researcher, 2 CFUGs, *Chyangrekharga Baglung* and *Salyanipakha Malika* with 2.65 and 3.74 relative livestock units residing a very shorter distance from *Baglung* headquarters also had good access to pasture lands in their CFUG area and outside of CFUG area as well. That provided the EC member households with higher units of livestock.

Table 6.7 The average livestock units for EC and non-EC Nepalese households

| | | EC Member | | Non-EC Member | | EC livestock/Non EC livestock |
|---|---|---|---|---|---|---|
| Sn | CFUG Name | Number of households | Livestock unit/household | Number of households | Livestock unit/household | |
| 31 | Daha Bhakunde 6, 7 | 6 | 1.92 | 4 | 3.30 | |
| 15 | Jogarani, Paiyupata 3 | 3 | 2.61 | 7 | 3.77 | 0.69 |
| 3 | Bhimra Sigana 3 | 6 | 3.26 | 4 | 3.56 | 0.92 |
| 19 | Dhandh Malika 2, 3 | 6 | 3.44 | 4 | 3.73 | 0.92 |
| 12 | Resh Buchung Salleri | 3 | 3.00 | 7 | 3.18 | 0.94 |
| 26 | Jhangali Baglung 9 | 6 | 3.85 | 4 | 4.06 | 0.95 |
| 23 | Ranibhumi Sigana 1, 2, 3 | 5 | 3.88 | 5 | 3.97 | 0.98 |
| 13 | Ramrekha Baglung 1 | 3 | 3.00 | 7 | 2.99 | 1.00 |
| 16 | Shakhini Chaur Painyupata 2 | 3 | 2.88 | 7 | 2.89 | 1.00 |
| 25 | SanguKhola Ratopahara, Resh 3, | 4 | 4.00 | 6 | 3.91 | 1.02 |
| 4 | Chamere Tityang 5 | 7 | 2.06 | 3 | 1.99 | 1.04 |
| 2 | DoyaPragati | 8 | 2.19 | 2 | 1.99 | 1.10 |
| 17 | Dhandkharka Bhakunde 9 | 6 | 3.80 | 4 | 3.44 | 1.10 |
| 1 | ByalDhara Baglung 7 | 6 | 2.88 | 4 | 2.58 | 1.12 |
| 21 | Gobreni Painyupata 6 | 5 | 4.99 | 5 | 4.32 | 1.16 |
| 20 | Titaure Palakot 7, 9 | 3 | 3.00 | 7 | 2.56 | 1.17 |
| 7 | Chhipchhepale Baglung 11 | 4 | 3.27 | 6 | 2.69 | 1.22 |
| 11 | Sunakhari Malika 7, 8, 9 | 7 | 3.29 | 3 | 2.66 | 1.24 |
| 6 | Simalpata Tityang 6, 7, 8 | 5 | 3.58 | 5 | 2.72 | 1.32 |
| 22 | Kuledanda Bhakunde 8 | 1 | 3.00 | 9 | 2.17 | 1.38 |
| 24 | Maluka Patal Resh 1, 2 | 5 | 3.92 | 5 | 2.78 | 1.41 |
| 5 | Bhagwati Chisapani Tityang 1 | 3 | 3.00 | 7 | 2.06 | 1.46 |
| 10 | Mauribhid Malika 5 | 6 | 3.52 | 4 | 2.40 | 1.47 |
| 28 | Dhurseni Baglung Balung 10 | 4 | 4.00 | 6 | 2.62 | 1.53 |
| 29 | Dhoreni Baglung 10, 11 | 7 | 4.48 | 3 | 2.71 | 1.65 |
| 27 | Chutreni Baglung 11 | 7 | 5.03 | 3 | 2.99 | 1.68 |
| 14 | Chitrepani Baglung 9 | 6 | 4.16 | 4 | 2.40 | 1.73 |
| 30 | Bancharedhunga Baglung 9 | 8 | 3.65 | 2 | 1.99 | 1.83 |
| 9 | Chyangrekharga Baglung 8 | 5 | 3.45 | 5 | 1.30 | 2.65 |
| 8 | Salyanipakha Malika 1,8, 9 | 8 | 3.29 | 2 | 0.88 | 3.74 |
| 18 | Chhaharedhara Baglung 4 | 10 | 3.28 | | | |
| | | Total 166 | Average 3.40 | Total 144 | Average 2.80 | 1.27 |

It can be seen that EC member households with an average of 3.4 livestock units have more units than non-EC member households that have an average 2.8 livestock units.

To examine whether the differences in livestock holdings between EC and non-EC members was statistically significant, a t-test was conducted. The t-statistic was 10.49 with a critical two-tail value of 1.96 (Table 6.8). This indicates that the difference in livestock holdings is statistically significant between EC and non-EC households. Higher livestock units are also linked to wealth (rich households). Hence, livestock holdings could be included as a variable to be tested in the econometric analysis.

Table 6.8 t-Test ratio matrix of livestock numbers of households on EC and non-EC member households in Nepal

| Category of household member | EC member livestock unit | Non-EC member livestock unit | Critical two-test value | Degrees of freedom |
|---|---|---|---|---|
| EC member livestock unit | | | | |
| Non-EC member livestock unit | 10.49* | | 1.96 | 581 |

* Statistically significant, critical two-tail value at the 5% significance level is 1.96.

### 6.2.4 Landholding

Access to land is believed to be a source of social power for selection to a leadership position in Nepalese society (Bennet, 2005; Bistha, 1991; Bode, 2009). Table 6.9 shows the EC and non-EC members' landholdings by CFUG as well as relative land holding.

Table 6.9 Landholding (ha)for EC and non-EC members

| SN | Name CFUG | EC member | Non-EC member | Relative landholding (EC/Non-EC) |
|---|---|---|---|---|
| 22 | Kuledanda Bhakunde 8 | 0.43 | 0.41 | 1.05 |
| 17 | Dhandkharka Bhakunde 9 | 1.21 | 1.02 | 1.19 |
| 5 | Bhagwati Chisapani Tityang 1 | 1.02 | 0.84 | 1.21 |
| 27 | Chutreni Baglung 11 | 1.15 | 0.95 | 1.21 |
| 29 | Dhoreni Baglung 10, 11 | 1.11 | 0.88 | 1.26 |
| 18 | Chhaharedhara Baglung 4 | 0.57 | 0.45 | 1.27 |
| 2 | DoyaPragati | 0.91 | 0.71 | 1.28 |
| 24 | Maluka Patal Resh 1, 2 | 0.98 | 0.73 | 1.34 |
| 16 | Shakhini Chaur Painyupata 2 | 0.68 | 0.48 | 1.42 |
| 9 | Chyangrekharga Baglung 8 | 0.88 | 0.62 | 1.42 |
| 19 | Dhandh Malika 2, 3 | 1.28 | 0.88 | 1.45 |
| 26 | Jhangali Baglung 9 | 1.38 | 0.92 | 1.50 |
| 30 | Bancharedhunga Baglung 9 | 1.41 | 0.93 | 1.52 |
| 10 | Mauribhid Malika 5 | 1.52 | 0.95 | 1.60 |
| 23 | Ranibhumi Sigana 1, 2, 3 | 2.88 | 1.78 | 1.62 |
| 7 | Chhipchhepale Baglung 11 | 2.81 | 1.72 | 1.63 |
| 15 | Jogarani, Paiyupata 3 | 2.29 | 1.38 | 1.66 |
| 1 | ByalDhara Baglung 7 | 2.51 | 1.51 | 1.66 |
| 25 | SanguKhola Ratopahara, Resh 3, | 2.63 | 1.58 | 1.66 |
| 12 | Resh Buchung Salleri | 2.77 | 1.66 | 1.67 |
| 4 | Chamere Tityang 5 | 2.61 | 1.55 | 1.68 |
| 6 | Simalpata Tityang 6, 7, 8 | 2.73 | 1.62 | 1.69 |
| 8 | Salyanipakha Malika 1,8, 9 | 1.63 | 0.96 | 1.70 |
| 28 | Dhurseni Baglung Balung 10 | 2.45 | 1.43 | 1.71 |
| 3 | Bhimra Sigana 3 | 2.21 | 1.28 | 1.73 |
| 31 | Daha Bhakunde 6, 7 | 1.71 | 0.98 | 1.74 |
| 11 | Sunakhari Malika 7, 8, 9 | 1.77 | 1.02 | 1.74 |
| 21 | Gobreni Painyupata 6 | 2.18 | 1.25 | 1.74 |
| 13 | Ramrekha Baglung 1 | 2.01 | 1.13 | 1.78 |
| 14 | Chitrepani Baglung 9 | 1.96 | 1.09 | 1.80 |
| 20 | Titaure Palakot 7, 9 | 2.09 | 1.15 | 1.82 |
| | Average | 1.73 | 1.09 | 1.54 |

Table 6.9 shows that the average landholding for EC members is 1.73 ha and non-EC members it is 1.09 ha, or a 50% larger landholding size for EC members. In the entire sample, in 30 of 31 CFUGs EC members had at least 20% larger landholdings than non-EC members. To examine whether the differences in relative land holding size between EC and non-EC members is statistically significant, a t-test was conducted (Table 6.10). The t-statistic (2.52) is higher than that of the critical two-tail value (2.00). This indicates that the difference in land holding size is positively statistically significant. Thus land holding could be correlated with the selection of leadership in EC. Hence, land holding size will be included as variable for the econometric analysis.

Table 6.10 t-Test of relative the comparison of own land between EC and non-EC members in Nepal

| | EC members own land | Non-EC members own land | Critical two tail value | Degrees of freedom | No of observations |
|---|---|---|---|---|---|
| EC member own land | | | | | |
| Non-EC member own land | 2.52* | | 2.00 | 60 | 31,31 |

* Statistically significant, critical two-tail value at the 5% significance level is 1.96.

### 6.2.5 Off-Farm Income

Off-farm income is also believed to be an important factor in determining leadership positions in developing countries like Nepal (Adhikari & Di-Falco, 2009; A. Agrawal & Gupta, 2005). It is hypothesised that for off-farm income, higher income households are more likely be in leadership positions because higher income households get more social respect. It is also expected that low income households will have the lowest representation in leadership positions. Table 6.11 shows the relative off-farm income of EC and non-EC households by CFUG. The relative off-farm income was calculated by dividing the individual household income by average off-farm income of the particular group. Average relative income of EC or non-EC member households was calculated by averaging the income of the households in the EC and non-EC groups.

The results indicate that across the 31 CFUGs. There were different off-farm relative incomes. The average of both EC and non-EC member households of relative off-farm income were 1.05 and 0.98, respectively. It seems that EC member households had 5% higher off farm income, on average. This indicates that the EC member households with relative off-farm income could also be directly associated with wealth status. Hence, it also supports the hypothesis that wealth is one of the assets in being selected for leadership positions of the CFUGs under both the consensually integrated elite model and the plural elite model of organisational elite model in Figure 3.1.

Table 6.11 Average relative off farm income of EC and Non-EC member households by CFUG

| SN | Name of the CFUG | Average relative off farm income of EC member household | Average relative off farm income of Non-EC member household | EC/Non EC |
|---|---|---|---|---|
| 9 | Chyangrekharga Baglung 8 | 1.43 | | |
| 23 | Ranibhumi Sigana 1, 2, 3 | 0.07 | 1.10 | 0.06 |
| 15 | Jogarani, Paiyupata 3 | 0.25 | 2.13 | 0.12 |
| 6 | Simalpata Tityang 6, 7, 8 | 0.37 | 1.41 | 0.26 |
| 14 | Chitrepani Baglung 9 | 0.58 | 1.63 | 0.36 |
| 30 | Bancharedhunga Baglung 9 | 0.78 | 1.92 | 0.41 |
| 8 | Salyanipakha Malika 1,8, 9 | 0.58 | 1.28 | 0.45 |
| 5 | Bhagwati Chisapani Tityang 1 | 0.82 | 1.72 | 0.48 |
| 2 | DoyaPragati | 0.89 | 1.47 | 0.54 |
| 13 | Ramrekha Baglung 1 | 0.84 | 1.38 | 0.61 |
| 26 | Jhangali Baglung 9 | 0.77 | 1.23 | 0.63 |
| 7 | Chhipchhepale Baglung 11 | 0.86 | 1.33 | 0.65 |
| 17 | Dhandkharka Bhakunde 9 | 0.79 | 1.14 | 0.69 |
| 12 | Resh Buchung Salleri | 0.79 | 1.14 | 0.69 |
| 16 | Shakhini Chaur Painyupata 2 | 0.85 | 1.21 | 0.71 |
| 3 | Bhimra Sigana 3 | 0.85 | 1.15 | 0.74 |
| 22 | Kuledanda Bhakunde 8 | 0.97 | 1.04 | 0.93 |
| 20 | Titaure Palakot 7, 9 | 1.04 | 1.03 | 1.01 |
| 10 | Mauribhid Malika 5 | 1.31 | 0.91 | 1.24 |
| 25 | SanguKhola Ratopahara, Resh 3, | 1.14 | 0.86 | 1.33 |
| 27 | Chutreni Baglung 11 | 1.16 | 0.76 | 1.53 |
| 28 | Dhurseni Baglung Balung 10 | 1.29 | 0.07 | 1.71 |
| 18 | Chhaharedhara Baglung 4 | 1.21 | 0.69 | 1.75 |
| 1 | ByalDhara Baglung 7 | 1.52 | 0.87 | 1.75 |
| 31 | Daha Bhakunde 6, 7 | 1.72 | 0.69 | 2.49 |
| 29 | Dhoreni Baglung 10, 11 | 1.33 | 0.05 | 2.66 |
| 4 | Chamere Tityang 5 | 1.78 | 0.67 | 2.66 |
| 21 | Gobreni Painyupata 6 | 1.99 | 0.58 | 3.43 |
| 24 | Maluka Patal Resh 1, 2 | 1.99 | 0.58 | 3.43 |
| 19 | Dhandh Malika 2, 3 | 1.21 | 0.17 | 7.12 |
| 11 | Sunakhari Malika 7, 8, 9 | 1.39 | 0.19 | 7.32 |
| | Average | 1.05 | 0.98 | 1.07 |

Source: Household survey

To examine whether the off-farm income per household was statistically different, a t-test assuming two unequal variables was conducted. The t-statistic mean was 1.38 and the critical two-tail value is 1.36 (Table 6.12), so there is a statistically significant difference between EC and non-EC member household in off-farm income. This indicates that the mean off-farm income between EC and non-EC member households is statistically positively significantly different and is likely to be a factor in determining leadership positions. Therefore it will be included as a factor in the econometric model.

Table 6.12 t-Test of relative off farm income of Nepalese EC and Non-EC member households

| | EC member | Non-EC member | Critical two-test value | Degrees of freedom | No of observations |
|---|---|---|---|---|---|
| EC member<br>Non-EC member | 1.38* | | 1.36 | 576 | 310310 |

* Statistically significant, critical two-tail value at the 5% significance level is 1.96.

### 6.2.6 Occupation of Household Head

The occupation of the household head could also be a factor determining EC leadership positions. It was theorised that households where the occupation was a farmer had a greater intention for EC positions than households with other occupations, such as teachers and public servants. Table 6.13 shows the household occupation by farmer, public service including ex-army and teacher. The result shows that of the 310 households surveyed, 220 households were farmers and 134of these were EC members. 45 household were public service and 21 were EC members. Among the 45 teachers, 11 were EC members. It seems that 80% of EC members are farmers that is more important. Thus, it seems that there could be a relationship between the occupation of farmer and EC membership of the CFUG.

Table 6.13 The occupations of household head and EC positions in Nepal

| | Farmer | Service [13] | Teacher | Total |
|---|---|---|---|---|
| EC | 134 | 21 | 11 | 166 |
| Non-EC | 86 | 24 | 34 | 144 |
| Total | 220 | 45 | 45 | 310 |

A two tail *t*-test assuming unequal variances was conducted to analyse whether these paired groups of occupations meant they are statistically different between each set of groups. Table 6.14 shows the test results evaluated at the 5% significance level. The results of the t-test by occupation of the household were farmer (2.68), public service (0.96) and teacher (0.20); the critical two tail value is 1.96. The results indicate that the farmer occupation is statistically positively significantly different and could be a determining factor in terms of being selected for EC positions of CFUGs. Hence, the occupation of the household as a farmer will be included in the econometric analysis.

13 Public servants including NGOs and the ex-army service people in CFUGs.

Table 6.14 The t-Test ratio matrix of Nepalese households head's occupation and EC position

| Two-Sample Assuming Unequal Variances of Occupation of Household head | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Category of Occupation | Farmer | Public Service | Teacher | Critical two-tail values | | DF | | No Of Observation | |
| Farmer | | | | | | | | | |
| PubServ | 2.68* | | | 1.96 | | 616 | | 310 | |
| Teacher | 0.96 | 0.20 | | 1.96 | 1.96 | 482 | 377 | 310 | 310 |

* Statistically significant, critical two-tail value at the 5% significance level is 1.96.

### 6.2.7 NGO Membership

NGOs build the capacity of people and can increase one's potential to be selected for a leadership position in CFUGs. It is hypothesised that households with members of an NGO have more social empowerment to receive training in leadership and management and are thus more likely to be selected for the EC. Table 6.15 shows the breakdown of EC membership and NGO membership across the households surveyed. The results show that, of the 310 households surveyed, 203 households were NGO members and 166 of those households were EC members. All EC member households were NGO members. Thus, there appears to be a relationship between membership of an NGO and a position in the EC.

Table 6.15 NGO experience and EC position in Nepal

| | NGO | Non NGO | Total |
|---|---|---|---|
| EC | 166 | 0 | 166 |
| Non-EC | 37 | 107 | 144 |
| Total | 203 | 107 | 310 |

It seems that more experience in NGO membership means a greater opportunity to be a member of the EC. The possible reason could be that NGOs empower the individual through training workshops and study tours (A. K. Singh & Stevens, 2007).

### 6.2.8 Conclusions from the Descriptive Statistics

The economic and social variables that were statistically significant by various descriptive and t-test analyses, were selected for econometric analysis. The economic variables wellbeing category, land holding, off farm income, livestock holdings, food sufficiency over 12 months and occupation were statistically significant. Similarly, the elite caste and *Janajati* ethnic caste households were statistically different. Thus, these variables correlated with the

selection for leadership positions of CFUGs and could be suitable factors for econometric analysis. The definitions and descriptions of the variables for analysing the research questions hypotheses described in Chapter 1 are explained in next section.

## 6.3 Definitions of the Econometric Variables

As discussed in Chapter 4, the variables included in the leadership analysis of the research are related to social structure, land resources, livestock and income. These variables are outlined in Table 6.16. The dependent variable is whether any household member is currently or has been a member of the EC. The value of the variable is 1 if a person is or has been a member of the EC and 0 if not.

Table 6.16 Independent variables for the econometric analysis

| | |
|---|---|
| **Social variables** | |
| ELITEHH | If household is caste elite (*Bahun, Chhetry, Newar and Thakuri*) 1, otherwise 0. |
| NGOMEM | If any household member is a member in an NGO 1, otherwise 0. |
| PPRSTHH | If the household is poor or poorest 1, otherwise 0. |
| OCCUFRM | Occupation of household head as a farmer 1, otherwise 0. |
| OCCUPUBS | If any household head is a public service 1, otherwise 0. |
| TEACHER | If household head is teacher 1, otherwise 0 |
| **Economic variables** | |
| FOOD12M | If sufficient food from own land for 12 months or more in a year 1, otherwise 0. |
| RINCOME | Relative off-farm income. |
| ROWNLAND | Relative own land. |
| RLIVSTOC | Relative livestock units. |

## 6.4 Leadership Regression Result

The regression analysis was conducted based on the conceptual model in Figure 4.1. The potential explanatory factors determining leadership (dependent variables), as recommended from the descriptive analysis for further analysis in a regression model, were examined in a binary logit model. The explanatory variables were examined in different functional forms (e.g. log or raw) as well as in their interactions. A multicollinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multicollinearity test in SPSS. As can be seen in matrix of Table 6.17, all the values are less than 3, confirming there was no multicolinearity.

The model building process took several steps. First, non-significant variables were deleted from the model in a step-by-step process until the model was stable. Since variable deletion creates a nested model, the model stability was examined by using the Chi-square test for

significant difference of -2log likelihood ratios, as suggested by Agresti and Finlay (2009) and Kleinbaum (1994). Univariate analyses were conducted, regressing each predictor separately against the dependent variable. Variables found to be significant in the univariate analyses ($p$ <0.25) were then entered into a multivariate backward-stepwise logit model. At this stage, only cases with values for all the predictors considered were used in the analysis. The McFadden, goodness-of-fit statistic was used to confirm the statistical goodness-of-fit of the final model.

Part of the leadership model looks at the relationship between leadership and the demographic characteristics of individual households. The independent variables entered in the first step of the logistic regression for determining selection as a leader were NGO membership (NGOMEM), poor and poorest household (PPRSTHH), household with food sufficiency of 12 months (FOOD12M), relative livestock holding units of households (RLIVSTOC), occupation of household head as farmer (OCCUFRM), relative of own land of households (ROWNLAND), occupation of household head as a public servant (OCCUPUBS), elite caste household (ELITEHH) and relative own off-farm income of households (RINCOME). The variables found to be significant after deleting the non-significant variables from the model in a step-by-step process until the model was stable are shown in Table 6.17. The expected signs of the variables are consistent with assumptions.

Table 6.17 The results of the binary logit model for binary choice

| Variable | Coefficient | Standard Error | B/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| Constant | .66940* | .3517 | -2.063 | .0543 |
| NGOMEM | .97945*** | .2211 | 3.747 | .0001 |
| PPRSTHH | -.40817*** | .1982 | -2.061 | .0001 |
| OCCUFRM | .92313*** | .2355 | 3.919 | .0145 |
| FOOD12M | .34356*** | .1865 | 1.846 | .0002 |
| RINCOME | .34596** | .1869 | 1.854 | .0342 |

Note: ***, **, * = Significance at 1%, 5%, 10% level

Multi Colinearity test matrix

| | NGO Mem | PPRSTHH | OCCUFRM | FOOD 12M | RINCOME |
|---|---|---|---|---|---|
| NGO Mem | | 1.086 | 1.167 | 1.020 | 1.100 |
| PPRSTHH | 1.012 | | 1.109 | 1.025 | 1.094 |
| OCCUFRM | 1.001 | 1.006 | | 1.007 | 1.109 |
| FOOD 12M | 1.007 | 1.087 | 1.147 | | 1.105 |
| RINCOME | 1.008 | 1.676 | 1.094 | 1.025 | |

McFadden Pseudo $R^2$ =0.52, Ben /Lerman $R^2$ was 0.57. Chi-squared=107.1848, Significance level .00009. The correct prediction successes: concordant 79.79 %. It means the correct prediction = actual 1s and 0s correctly predicted was 79.79% and discordant 20.21%

There is no widely-accepted direct analogy to OLS regression's $R^2$ (Hoetker, 2007; Long, 1997). This is because the $R^2$ measure seeks to make a statement about the percentage of variance explained, but the variance of a dichotomous or categorical dependent variable depends on the frequency distribution of that variable. $R^2$ in an OLS regression model commonly provides a measure of how well the model fits the data. However, there is no direct equivalent to $R^2$ for the logistic regression model (Hoetker, 2007). Scholars state that Pseudo $R^2$ measures have been proposed for a wide range of binary data. These measures have different formulae for Pseudo $R^2$ and take different values for the same model (Long, 1997). For example, Veall and Zimmermann (1996) described a model in which McFadden's Pseudo $R^2$ was 0.25 and the McKevey- Zavina Pseudo $R^2$ was 0.50. Hence, one cannot compare this model with the OLS $R^2$ or similar models in other research. Another possible reason that some researchers misinterpret the meaning of the measures that corresponds to the % of variance explained as $R^2$ does in OLS. The MacFadden's Pseudo $R^2$ and MacFadden's Adjusted $R^2$ are calculated as:

MacFadden's Pseudo $R^2$ =1- $\frac{In\,\hat{}u}{In\,\hat{}r}$ where ĵu and ĵr are the likelihoods of the model with and without regressors, respectively.

MacFadden's Adjusted $R^2$ =1-$\frac{In\hat{}u-K}{In\ \hat{}r}$ where K is the number of regressors.

Most Pseudo $R^2$ measures have no unintended interpretation for values other than 0 or 1. The Pseudo $R^2$ statistic is a well-known $R^2$ statistic that measures the variability in the dependent variable that is explained by a linear regression model, but cannot be computed by binary choice regression models because the dependent variable is dichotomous rather than continuous (Cox & Snell, 1989; Hoetker, 2007). Binary regression does not have an equivalent to the $R^2$ that is found in OLS regression but many researchers have tried to produce one (Azzalini, 2007). There is a wide variety of Pseudo $R^2$ statistics that can give contradictory conclusions. Because these statistics do not mean what $R^2$ means in OLS regression (the proportion of variance for the response variable explained by the predictors), it is suggested that they need to be interpreted with great caution (Azzalini, 2007; Scott & Freese, 2006).hence, binary dichotomous variable is generally lower $R^2$ value than OLS regression.

The likelihood ratio (LR) Chi-square test determines that at least one of the predictors' regression coefficients is not equal to zero in the model. The LR Chi-Square statistic is calculated by -2*L (null model) - (-2*L (fitted model)) = -206.27036 -99.08552= 107.1848, where *L* (null model) is from the log likelihood with just the response variable in the model (Iteration 0) and *L* (fitted model) is the log likelihood from the final iteration (assuming the model converged) with all the parameters. Goodness-of-fit statistics assess the fitting of the logistic model against the factual classification such as low, medium and high level of attributes.

The variable NGO member (NGOMEM) is positively significant at the 1% level. This implies that a household involved in an NGO has a higher probability of being selected as a leader on an EC. NGO membership might have developed leadership capacity or motivated someone to be a leader. The policy implication of this finding is that if the poor and oppressed lower castes are given the opportunity to develop their leadership capacity such as an NGO, they could be represented more on ECs. This result is similar to those of Agrawal and Gupta (2005) and Maskey et al. (2006) who stated that being an NGO member increases the chance of being selected for a position of leadership.

The variable poor and poorest household **(**PPRSTHH**)** is negatively significant at the 1% level. This means that the poor and poorest households are less likely to be selected as EC members of CFUGs. It shows the strong correlation with the hypothesis that the poor and poorest households are less likely to get opportunities to be on the EC of CFUGs. One reason could be the economic constraints for the poorest households who could not get opportunities to participate in decision-making positions (Maskey, et al., 2006). They might also be discouraged from taking leadership due to their socially vulnerable position. Adhikari and Di-Falco (2009) and Lachapelle et al. (Lachapelle, et al., 2004) found that poor households have been excluded from leadership positions due to their social status embedded by poverty.

The variable for occupation of household head as a farmer (OCCUFRM) is positive and statistically significant at the 1% level. Households with farmers are involved in the collection of forest products particularly firewood, fodder and leaf litter, and have an incentive to be involved in CF decisions. Therefore, being a farmer increases the probability of selection for membership on the CFUG executive committee. This result is similar to those of Adhikari and Di-Falco (2009) and Baland et al. (2007) who argued that farmer households have used of votes for selecting leadership positions of the CFUG.

The variable food for 12 months food sufficiency (FOOD12M) is positive and statistically significant at the 1% level. This indicates that households with sufficiency of food for 12 months are more likely to be selected as EC members. This result is similar to the results of A. Agrawal and Chhatre (2006) and Adhikari et al. (2004) who found that households with food sufficiency for 12 months are more represented on the EC.

The variable for relative off-farm income (RINCOME) is positive and significant at the 5% level. This result indicates that the probability of being a leader on the EC is higher for a household with relatively higher off-farm income. Off-farm income is a source of household income that provides economic power. This result is similar to those of Adhikari et al. (2004) and A. Agrawal (2007) who stated that richer households that have large sources of off-farm income have a higher probability of being in leadership positions.

## 6.5 Conclusions

This study draws several conclusions about Nepalese social structural factors that provide opportunities for poor households to be in leadership positions in ECs of CFUGs. The purpose of this chapter was to determine whether there are factors that would enable the poor and disadvantaged to gain membership of the EC of CFUGs. The factor found to be related to the leadership positions is NGO membership.

The results also show the usual factors that favour the traditional elite, including 12 month food sufficiency, relatively good off-farm income and other wealth attributes. Specifically it is the wealth attributes of the households that increases the probability of being selected for EC positions. These findings are in line with a number of studies have found that the wealthier and powerful local wealth elite tend to have more opportunity to be selected as leaders on the ECs of CFUGs (Adhikari & Di-Falco, 2009; Adhikari, et al., 2004; A. Agrawal, 2007; A. Agrawal & Chhatre, 2006; A. Agrawal & Gupta, 2005; Dhakal & Bhatta, 2010; Ostrom, 2005).

The poorer and disadvantaged ordinary members who get the opportunity to become a member of a NGO also get the opportunity become skilled in leadership and decision-making and this attribute makes them more likely to be selected for a leadership position on an EC. NGOs could train people for leadership positions on the ECs of CFUGs. NGOs, as social mobilisation service providers, are generally responsible for a wide range of service provision; they build capacity, provide study tours and workshops for group members of

community institutions to strengthen their capacity, make local institutional arrangements, help in record keeping, leadership and communication skill development in programmes implemented for rural development including community forestry user groups in Nepal. The policy implications of this finding are that if the poor and disadvantaged, the low socioeconomic groups of Nepalese society, could have the opportunity to develop their leadership capacity, they could be better represented on ECs and so influence the decisions in their favour. Thus, the key finding is that the poor can become part of the decision-making process, entering the EC on the basis of external leadership skills they have gained through NGOs.

In the theoretical model, depending on the mix of castes in a community, the poor and disadvantaged households gain power through the CFUG in line with the organisation elite model A or organisational elite model B (Figure 3.1). In a community of only one caste, organisational elite model A applies and where there are many castes, organisational elite model B works. However, caste was not a significant variable the in results. These results suggest that caste is not a factor linked with leadership selection.

In summary, households that have experience with on an NGO are more likely to be in leadership. This means that the organisational elite models A and B provide an opportunity for the poor and disadvantage households to become part of the EC. This answers the first hypothesis of this research that there are factors not related to wealth or caste that increase the likelihood of being on the EC. This is an important outcome and provides an opening for policy initiatives that encourage the development of leadership skills for the poor and disadvantaged.

Therefore the results of this chapter suggest that wellbeing category is a significant factor for selection of leadership, so the proportion of poor and disadvantaged households on the EC is should be used as variables important for analysing the distribution of CF products and the distribution rules for the next chapters. In this way, the effect of the organisational elite models where there are proportions of poor and disadvantaged households on the EC can be studied.

# Chapter 7
# RELATIVE DISTRIBUTION OF COMMUNITY FOREST PRODUCTS

## 7.1 Introduction

This chapter attempts to answer the research question: Does the composition of the EC affect who gets benefits from the community forest? Specifically, if the poor and disadvantaged groups have representation on the EC does it increase the distribution of benefits from CF to them? It is hypothesised that when organisational elite models exist, either when the community is homogenous in caste (organisational elite A) or where the community in heterogeneous in caste (organisational elite model B), opportunities are created to ensure greater benefits flow to the poor and disadvantaged members of society. The analysis is concerned with whether the distribution attributes and practices developed, or implemented, by ECs have any bearing on the distribution of CF products. This is empirically examined in the context of the average relative distribution of timber, firewood, fodder and leaf litter.

This chapter is organised as follows. First, the descriptive characteristics of the data are presented. The descriptive statistics are used to analyse the data collected from the research site. Secondly, the results of the econometric analysis are explained. The conclusions from the major findings end the chapter.

## 7.2 Descriptive Statistics

Descriptive methods were used to examine the data for the variables suitable for analysis in a regression model. In this section, the relevant data sets are explained and examined in relation to the dependent variables average relative distribution of firewood, timber, fodder and leaf litter. The average relative distribution to households is used as the dependent variable because of different forest endowments between CFUGs.

The independent variables include institutional factors such as the frequency of EC and assembly meetings, the discussion time in EC and assembly meetings, the involvement of EC and assembly meetings in the preparation of the operational plan, and the agenda items raised by various members in EC and assembly meetings, and the forest attributes including the CF area per household, the CF type and forest crown cover class.

In the context of CF, it is expected that non-timber forest products (NTFPs) would be collected. However, only five CFUGs collected NTFPs from their CF. The maximum was 7.91 kg per household in the *Ramrekha* CFUG. This was the only CFUG that cultivated NTFPs in their CF as part of a pro-poor programme activity. Because so few CFUGs produced NTFPs, further analysis of NTFP data is excluded from this study.

### 7.2.1 Average Relative Distribution and Forest Area

The dependent variables are the average relative distribution of firewood, timber and fodder and the leaf litter. The average relative distribution CF products to a household were calculated by taking the average distribution for all households surveyed in the CFUG and dividing each household's amount by this value. For example, in each CFUG, 10 households were surveyed. The average distribution of firewood to the 10 sampled households was calculated. The distribution to each household was then divided by the average of the 10 households. After doing this, the average relative amount was derived for each wellbeing category household (rich, medium, poor and poorest). Similarly, the average relative distribution was also calculated for each ethnic caste household, where applicable. Using this method, the average relative distribution was calculated for each CF product in each CFUG.

Average relative distribution was used because of unequal forest endowments among CFUGs which means that actual distribution amounts are very different between CFUGs, irrespective of wellbeing category or ethnic caste. If the average relative distribution is 1 it means that the household gets the average (good distribution). If it is more than 1 then it means that the household gets more than the average (over distribution) and if it is less than 1 it means that the household gets less than the average (low distribution). Table 7.1 shows the average relative distribution of forest products per household by wellbeing category and per household forest area.

Firewood is a significant source of household energy, particularly for cooking and heating in Nepalese society (National Planning Commission, 2007). Table 7.1 shows that the poor and poorest households received relatively less firewood than rich and medium households. The average relative amount of firewood distributed to the poor and poorest households generally increases as the area of the forest per household increases. This means poor households are relatively worse off when the forest area per household is smaller.

Table 7.1 The average relative distribution of CF products per Nepalese household by forest size

| | | Average relative distribution per household type | | | |
|---|---|---|---|---|---|
| Forest Size (ha) | Number of households | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 0.07 and less | 50 | 1.54 | 1.51 | 0.48 | 0.46 |
| 0.08-0.13 | 70 | 1.31 | 1.29 | 0.72 | 0.68 |
| 0.14-0.18 | 70 | 1.14 | 1.21 | 0.94 | 0.72 |
| 0.19-0.32 | 60 | 1.11 | 1.18 | 0.97 | 0.73 |
| 0.33 and above | 60 | 1.05 | 1.15 | 1.02 | 0.78 |
| | | | Fodder and grass | | |
| 0.07 and less | 50 | 1.38 | 1.23 | 0.65 | 0.74 |
| 0.08-0.13 | 70 | 1.25 | 1.20 | 0.74 | 0.82 |
| 0.14-0.18 | 70 | 1.16 | 1.14 | 0.84 | 0.85 |
| 0.19-0.32 | 60 | 1.05 | 1.11 | 0.94 | 0.88 |
| 0.33 and above | 60 | 0.95 | 1.04 | 0.99 | 1.04 |
| | | | Leaf litter | | |
| 0.07 and less | 50 | 0.98 | 1.15 | 0.75 | 1.11 |
| 0.08-0.13 | 70 | 0.89 | 1.05 | 0.91 | 1.15 |
| 0.14-0.18 | 70 | 0.88 | 0.99 | 0.95 | 1.19 |
| 0.19-0.32 | 60 | 0.85 | 0.94 | 1.01 | 1.21 |
| 0.33 and above | 60 | 0.31 | 0.82 | 1.32 | 1.53 |
| | | | Timber | | |
| 0.07 and less | | | | | |
| 0.08-0.13 | 30 | 1.50 | 1.20 | 0.77 | 0.53 |
| 0.14-0.18 | 30 | 1.53 | 1.22 | 0.74 | 0.51 |
| 0.19-0.32 | 10 | 1.65 | 1.31 | 0.65 | 0.38 |
| 0.33 and above | 40 | 1.65 | 1.35 | 0.61 | 0.37 |

Tree fodder and grass are important to supply the feed required for livestock to promote milk, butter and fat production in lactating animals, rapid live weight gain and animal health (Sekhar, 1998). Fodder can be green food but can be dried food like hay, straw and the material for stall feeding to cattle. In a mixed farming system like the middle hills of Nepal, all of fresh grass and herbage, ferns, and foliage from trees, which are lopped for feeding purposes to cattle, are classed as fodder (Mahat, Griffin, & Shepherd, 1987). Fodder has been collected since the introduction of CF in the hills of Nepal (Malla, et al., 2005). Leaves of trees and grass are important constituents of CF for livestock feed and serve as supplements to private residues. The average relative amount of fodder and grass distributed to the poor and poorest households increased as per household area of the forest increased.

Leaf litter is an important CF product and is used as bedding for livestock and as compost with animal manure (Food & Agriculture Organisation, 2005; Malla, et al., 2005; Sekhar, 1998; Shepherd & Gill, 1999). The average relative distribution to the poor households is

generally higher than for rich households and increases as the forest area per household increases. This is the only CF product where the poor are never relatively worse off in terms of distribution.

In Nepal, timber is widely used for house construction, shelter for animals, agricultural tools, furniture and other domestic uses. The average relative distribution of timber to the poor and poorest households showed that they were much worse off than the rich although the difference decreased as the forest area per household increased.

In summary, the analysis of per household forest area and the average relative distribution of firewood, fodder timber and leaf litter provided a clear case for forest area per household to be used for the regression analysis. The amount of firewood, fodder and leaf litter distributed per household is generally less to the poor than to rich households but increased to the poor and poorest household as per the household forest area increased. For timber, the disparity in average relative distribution remains large irrespective of per household forest area.

### 7.2.2 Average Relative Distribution and Forest Type

Broadleaf forests produce multiple products such as firewood, timber, leaf litter and fodder. It is expected that poor households are likely to benefit more in CFUGs with mixed or broadleaf forests than with conifer forests because the conifer forest is acidic and there is little chance to grow fodder. It can be seen in Table 7.2 that the average relative distribution of fodder and leaf litter to the poor and poorest was higher in broadleaf and mixed forests than conifer forest. It is known that conifer forest does not produce fodder but, in this survey, the data on fodder and grass were collected together. Therefore, the distribution of fodder and grass appears in the conifer forest results. Based on this analysis, broad leaf and mixed forest types will be used in the regression analysis.

Table 7.2 The average relative distribution of CF products per household by forest type

| Forest type | Number of households | Average relative distribution per household type | | | |
|---|---|---|---|---|---|
| | | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| Conifer | 120 | 1.30 | 1.25 | 0.84 | 0.61 |
| Broad leaf | 50 | 1.25 | 1.15 | 0.92 | 0.68 |
| Mixed | 140 | 1.32 | 1.08 | 0.87 | 0.74 |
| | | | Fodder and grass | | |
| Conifer | 120 | 1.20 | 1.30 | 0.81 | 0.71 |
| Broad leaf | 50 | 1.35 | 1.10 | 0.81 | 0.78 |
| Mixed | 140 | 1.25 | 0.78 | 0.86 | 1.10 |
| | | | Leaf litter | | |
| Conifer | 120 | 1.37 | 1.21 | 0.84 | 0.58 |
| Broad leaf | 50 | 0.77 | 0.65 | 1.42 | 1.49 |
| Mixed | 140 | 0.71 | 0.68 | 1.21 | 1.41 |
| | | | Timber | | |
| Conifer | 60 | 1.88 | 0.88 | 0.85 | 0.37 |
| Broad leaf | 10 | 1.01 | 1.28 | 0.88 | 0.81 |
| Mixed | 40 | 1.53 | 1.05 | 0.55 | 0.88 |

### 7.2.3 Average Relative Distribution and Forest Crown Cover Class

As described in Chapter 4, crown cover is defined as the percentage of crown area projected on to total land area. It is hypothesised that the denser the crown covers the better the availability of and distribution of CF products to the poor and poorest households.

Table 7.3 Average relative distribution of CF products in Nepal by crown cover class

| Crown cover class | Number of households | Average relative distribution per household type | | | |
|---|---|---|---|---|---|
| | | Rich | Medium | Poor | Poorest |
| | | Firewood | | | |
| 30 to 50 % | 30 | 1.59 | 1.54 | 0.51 | 0.36 |
| 50 to 70 % | 130 | 0.99 | 0.88 | 1.02 | 1.11 |
| above 70 % | 150 | 0.42 | 0.58 | 1.47 | 1.53 |
| | | Fodder and grass | | | |
| 30 to 50 % | 30 | 1.57 | 1.54 | 0.48 | 0.41 |
| 50 to 70 % | 130 | 0.94 | 1.03 | 1.02 | 1.01 |
| above 70 % | 150 | 0.49 | 0.43 | 1.50 | 1.58 |
| | | Leaf litter | | | |
| 30 to 50 % | 30 | 1.25 | 1.52 | 0.62 | 0.61 |
| 50 to 70 % | 130 | 0.92 | 0.93 | 1.10 | 1.05 |
| above 70 % | 150 | 0.83 | 0.55 | 1.28 | 1.34 |
| | | Timber | | | |
| 30 to 50 % | 30 | 1.47 | 1.51 | 0.52 | 0.50 |
| 50 to 70 % | 30 | 0.96 | 0.92 | 1.10 | 1.02 |
| above 70 % | 50 | 0.57 | 0.57 | 1.38 | 1.48 |

Note: NO forest had less than 30% crown cover and timber was distributed from only 14 CFUGs.

Table 7.3 shows that the average relative distribution of firewood, fodder, leaf litter and timber to the poorer and poorest households increased as the crown cover increased. Based on this, crown cover should be included as a variable in the regression analysis.

### 7.2.4 Average Relative Distribution and Agenda Items Raised in Meetings

The setting of a meeting agenda is a roadmap for the decisions to be made in a meeting. It lets decision makers become acquainted with where they are headed so they are not side tracked. It directs the participants to move in a particular direction or to a particular place. Most significantly, the meeting agenda offers a sense of purpose and direction to the meeting. It is hypothesised that the higher the proportion of agenda items per meeting raised by the disadvantaged (lower caste and marginalised) members, the greater the opportunity to address

their needs for CF products. Table 7.4 shows the proportion of agenda items raised by disadvantaged members at assembly and EC meetings.

Table 7.4 The proportion of agenda items raised by various members per EC and assembly meetings

| | | Assembly meetings | | | EC meetings | | |
|---|---|---|---|---|---|---|---|
| SN | CFUG name | EC members | Disadvantaged members | Other members | EC members | Disadvantaged members | Other members |
| 1 | Byaldhara Baglung 7 | 0.67 | 0.33 | 0.00 | 0.88 | 0.08 | 0.04 |
| 2 | Doyapragasti | 0.57 | 0.14 | 0.29 | 0.56 | 0.25 | 0.19 |
| 3 | Bhimara Sigana | 0.38 | 0.10 | 0.52 | 0.39 | 0.56 | 0.06 |
| 4 | Chamere Tityang, 5 | 0.86 | 0.14 | 0.00 | 0.70 | 0.05 | 0.25 |
| 5 | Bhagawat ChisapaniTitang 1 | 0.88 | 0.13 | 0.00 | 0.92 | 0.04 | 0.04 |
| 6 | Simal pata Titang 6,7,9 | 0.79 | 0.05 | 0.16 | 0.88 | 0.06 | 0.06 |
| 7 | Chhipchhipepale Baglung 11 | 0.56 | 0.00 | 0.44 | 1.00 | 0.00 | 0.00 |
| 8 | Daha Bhakunde 6,7 | 0.68 | 0.00 | 0.32 | 0.96 | 0.00 | 0.04 |
| 9 | Jhangali Baglung 9 | 0.96 | 0.04 | 0.00 | 0.52 | 0.00 | 0.48 |
| 10 | Bancharedunga Baglung 9 | 0.93 | 0.00 | 0.07 | 0.86 | 0.03 | 0.10 |
| 11 | Chutreni Baglung 11 | 0.92 | 0.08 | 0.00 | 0.43 | 0.09 | 0.49 |
| 12 | Dhursheni Baglung 10 | 0.86 | 0.14 | 0.00 | 0.86 | 0.14 | 0.00 |
| 13 | Dhoreni Baglung 10,11 | 0.84 | 0.05 | 0.11 | 0.90 | 0.00 | 0.10 |
| 14 | Gobneri Painyopata 6 | 0.63 | 0.00 | 0.38 | 0.47 | 0.07 | 0.47 |
| 15 | Kuledanda Bhakunde 8 | 0.65 | 0.12 | 0.24 | 0.63 | 0.11 | 0.26 |
| 16 | Rani bhumi Sigana 1 2 3 | 0.58 | 0.00 | 0.42 | 0.64 | 0.00 | 0.36 |
| 17 | Malukapatal Resh 1, 2 | 0.60 | 0.00 | 0.40 | 0.32 | 0.00 | 0.68 |
| 18 | SanghukholaRatopaharaResh 3,4 | 0.89 | 0.00 | 0.11 | 0.58 | 0.08 | 0.33 |
| 19 | Dhandh Malika 2,3 | 0.75 | 0.13 | 0.13 | 0.74 | 0.00 | 0.26 |
| 20 | Titaure Palakot 7-9 | 0.71 | 0.12 | 0.18 | 0.60 | 0.20 | 0.20 |
| 21 | Slyanipakha, Malika 1,3,4 | 0.77 | 0.15 | 0.08 | 0.86 | 0.08 | 0.06 |
| 22 | Chyangrekharga Baglung 8 | 0.91 | 0.09 | 0.00 | 0.60 | 0.00 | 0.40 |
| 23 | Mauribhid Malika 5 | 0.85 | 0.08 | 0.08 | 0.57 | 0.10 | 0.33 |
| 24 | Sunakhari Malika 7,8,9 | 0.82 | 0.14 | 0.04 | 0.74 | 0.07 | 0.19 |
| 25 | Ramrekha Baglung 1 | 1.00 | 0.00 | 0.00 | 0.95 | 0.00 | 0.05 |
| 26 | Chitepani Baglung 9 | 0.71 | 0.14 | 0.14 | 0.41 | 0.14 | 0.46 |
| 27 | ReshBuchhung salleri | 0.83 | 0.00 | 0.17 | 0.47 | 0.00 | 0.53 |
| 28 | Chhaharedhara Baglung 4 | 1.00 | 0.00 | 0.00 | 0.71 | 0.10 | 0.19 |
| 29 | Dhadhkarka Bhakunde 9 | 0.64 | 0.14 | 0.21 | 0.53 | 0.12 | 0.35 |
| 30 | Shakhinichaur Paiyopata 2 | 0.75 | 0.25 | 0.00 | 0.92 | 0.08 | 0.00 |
| 31 | Jograni Painyopata 3 | 0.46 | 0.23 | 0.31 | 0.47 | 0.18 | 0.35 |
| | Average | 0.76 | 0.13 | 0.15 | 0.68 | 0.12 | 0.26 |

The average proportion of agenda items raised by EC members is higher in both EC and assembly meetings than agenda items raised by disadvantaged members. This shows the importance of EC membership for the poor and disadvantaged.

The average relative distribution of CF products was analysed based on the proportion of agenda items raised by the EC members and disadvantaged households in EC and assembly

meetings. The average relative distribution of CF products based on the proportion of agenda items raised by disadvantaged members in the EC meetings is shown in Table 7.5. The hypothesis is that when the proportion of agenda items raised by disadvantaged member increases, the poor and poorest households will receive relatively larger amounts of CF products. As can be seen in Table 7.5, the average relative distribution of the CF products for the poor and poorest households generally increased as the proportion of the agenda items raised by disadvantaged members in EC meetings increased.

Table 7.5 The average relative distribution and proportion of agenda items raised by disadvantaged members in EC meetings

| | | Average relative distribution per household | | | |
|---|---|---|---|---|---|
| Proportion of agenda items raised by disadvantaged members | No of CFUGs | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 0 | 10 | 1.63 | 1.18 | 0.75 | 0.45 |
| 0.03-0.08 | 10 | 1.35 | 1.14 | 0.97 | 0.54 |
| 0.09-0.14 | 7 | 1.12 | 1.11 | 1.15 | 0.62 |
| 0.18-0.56 | 4 | 1.05 | 1.02 | 1.21 | 0.71 |
| | | | Fodder and grass | | |
| 0 | 10 | 1.26 | 1.07 | 0.76 | 0.89 |
| 0.03-0.08 | 10 | 0.76 | 0.95 | 1.05 | 1.25 |
| 0.09-0.14 | 7 | 0.42 | 0.92 | 1.28 | 1.37 |
| 0.18-0.56 | 4 | 0.22 | 0.90 | 1.35 | 1.53 |
| | | | Leaf litter | | |
| 0 | 10 | 0.77 | 0.92 | 1.05 | 1.28 |
| 0.03-0.08 | 10 | 0.66 | 0.89 | 1.31 | 1.15 |
| 0.09-0.14 | 7 | 0.66 | 0.68 | 1.32 | 1.35 |
| 0.18-0.56 | 4 | 0.55 | 0.61 | 1.38 | 1.49 |
| | | | Timber | | |
| 0 | 3 | 1.54 | 1.21 | 0.77 | 0.48 |
| 0.03-0.08 | 3 | 1.42 | 1.19 | 0.78 | 0.61 |
| 0.09-0.14 | 4 | 1.32 | 0.92 | 0.81 | 0.94 |
| 0.18-0.56 | 4 | 1.14 | 0.73 | 0.99 | 1.15 |

The CFUG has the authority to set objectives of conducting an assembly meeting where there are legal entities to formulate rules, regulations and they could maintain autonomy in decision-making for benefit distribution and sharing forest products obtained from CF because there is full participation of CFUG members. Again, the average relative distribution of firewood, fodder, leaf litter and timber to the poor and poorest households generally increased as the proportion of agenda items raised by disadvantaged members in assembly meetings increased (Table 7.6).

Table 7.6 The average relative distribution and proportion of agenda items raised by disadvantaged members per assembly meeting

| | | Average relative distribution per household type | | | |
|---|---|---|---|---|---|
| Proportion of agenda raised by disadvantaged members | Number of CFUGs | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 0 | 10 | 1.24 | 1.12 | 1.08 | 0.55 |
| 0.04-0.12 | 9 | 1.11 | 0.98 | 1.21 | 0.68 |
| 0.13-0.14 | 8 | 1.02 | 0.89 | 1.27 | 0.81 |
| 0.15-0.33 | 4 | 0.63 | 0.65 | 1.31 | 1.41 |
| | | | Fodder and grass | | |
| 0 | 10 | 1.61 | 0.86 | 0.79 | 0.73 |
| 0.04-0.12 | 9 | 1.47 | 0.87 | 0.85 | 0.81 |
| 0.13-0.14 | 8 | 1.05 | 0.89 | 0.95 | 1.09 |
| 0.15-0.33 | 4 | 0.78 | 1.05 | 0.96 | 1.21 |
| | | | Leaf litter | | |
| 0 | 10 | 0.68 | 0.71 | 1.62 | 0.99 |
| 0.04-0.12 | 9 | 0.81 | 0.79 | 1.41 | 1.00 |
| 0.13-0.14 | 8 | 1.03 | 0.98 | 0.94 | 1.04 |
| 0.15-0.33 | 4 | 1.11 | 0.99 | 0.71 | 1.18 |
| | | | Timber | | |
| 0 | 3 | 1.50 | 0.34 | 1.05 | 1.12 |
| 0.04-0.12 | 3 | 1.41 | 0.64 | 0.88 | 1.08 |
| 0.13-0.14 | 4 | 0.83 | 0.68 | 1.11 | 1.38 |
| 0.15-0.33 | 4 | 0.53 | 0.85 | 1.21 | 1.41 |

In summary, the results of this section show that the average relative distribution of CF products for the poor and poorest households increased when the number of agenda items raised by them increased. The effect is greatest when there is an assembly meeting. This is a greater opportunity for the disadvantaged (poor, lower caste) members to raise their needs and voices in terms of agenda items compared with EC meetings. This result is similar to that of R. Pokharel (2009) who found that user assembly meetings provided a reflective, democratic and interactive knowledge interface that allowed poor households to raise more agenda items and, in turn, gain more benefits. As a result of this analysis, the proportion of agenda items raised by disadvantaged members in EC and assembly meetings is to be used in the regression analysis.

### 7.2.5 Average Relative Distribution and Annual Frequency of Meetings

Decisions about CF management and benefit distribution are usually made in meetings. It is hypothesised that if the meetings are held more frequently, the poorer households would have more opportunity to present their demands for CF products and thus increase the average relative distribution. As can be seen in Table 7.7, the average relative distribution of firewood, fodder and timber to the poor and poorest household increased as the number of EC meetings per year increased. This result supports the hypothesis that if the frequency of meetings increased the poor and poorest households would get more opportunity to raise their needs for discussion.

Table 7.7 The average relative distribution of CF products by annual frequency of EC meetings

| Frequency of EC meetings per year | Number of CFUGs | Average relative distribution per household | | | |
|---|---|---|---|---|---|
| | | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 6-8 | 7 | 1.35 | 1.21 | 0.75 | 0.69 |
| 9-10 | 7 | 1.08 | 1.06 | 0.92 | 0.94 |
| 10-12 | 12 | 0.85 | 1.11 | 1.05 | 0.99 |
| 13 and Above | 5 | 0.77 | 0.96 | 1.21 | 1.06 |
| | | | Fodder and grass | | |
| 6-8 | 7 | 1.43 | 1.19 | 0.77 | 0.61 |
| 9-10 | 7 | 1.18 | 1.03 | 0.92 | 0.87 |
| 10-12 | 12 | 0.88 | 0.96 | 1.04 | 1.12 |
| 13 and Above | 5 | 0.75 | 0.85 | 1.19 | 1.21 |
| | | | Leaf litter | | |
| 6-8 | 7 | 2.25 | 0.74 | 0.77 | 0.24 |
| 9-10 | 7 | 1.52 | 0.85 | 0.85 | 0.78 |
| 10-12 | 12 | 1.14 | 0.93 | 0.95 | 0.98 |
| 13 and Above | 5 | 1.01 | 1.01 | 0.99 | 0.99 |
| | | | Timber | | |
| 6-8 | 3 | 2.01 | 1.59 | 0.11 | 0.29 |
| 9-10 | 3 | 1.41 | 1.39 | 0.48 | 0.72 |
| 10-12 | 4 | 1.25 | 1.26 | 0.58 | 0.91 |
| 13 and Above | 4 | 0.98 | 1.02 | 1.03 | 0.97 |

The average relative distribution CF products per household by wellbeing category and annual frequency of assembly meetings are shown in Table 7.8. Again, the average relative distribution of firewood, fodder, leaf litter and timber to the poor and poorest households generally increased as the number of assembly meeting increased. The findings indicate that the poor and poorest households can increase their average relative benefits when more

assembly meetings are held. This supports the hypothesis that more meetings will benefit the poor.

Table 7.8 The average relative distribution of CF products and annual frequency of assembly meetings

| | | Average relative distribution per household | | | |
|---|---|---|---|---|---|
| Annual requency of assembly meetings | Number of CFUGs | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 1 | 4 | 1.47 | 1.25 | 0.81 | 0.45 |
| 2 | 22 | 1.13 | 1.15 | 0.89 | 0.82 |
| 3 | 2 | 1.12 | 0.98 | 0.99 | 0.92 |
| 4 or more | 3 | 1.01 | 0.74 | 1.32 | 0.93 |
| | | | Fodder and grass | | |
| 1 | 4 | 1.11 | 1.09 | 0.78 | 1.02 |
| 2 | 22 | 0.92 | 0.98 | 0.99 | 1.11 |
| 3 | 2 | 0.85 | 0.68 | 1.23 | 1.24 |
| 4 or more | 3 | 0.74 | 0.65 | 1.30 | 1.31 |
| | | | Leaf litter | | |
| 1 | 4 | 0.97 | 0.86 | 1.15 | 1.01 |
| 2 | 22 | 0.95 | 0.82 | 1.19 | 1.04 |
| 3 | 2 | 0.43 | 1.10 | 1.21 | 1.26 |
| 4 or more | 3 | 0.33 | 1.11 | 1.29 | 1.28 |
| | | | Timber | | |
| 1 | 3 | 2.18 | 1.57 | 0.15 | 0.11 |
| 2 | 3 | 1.58 | 1.44 | 0.78 | 0.19 |
| 3 | 4 | 1.02 | 1.08 | 1.12 | 0.78 |
| 4 or more | 4 | 0.95 | 1.01 | 1.15 | 0.88 |

As a result of this analysis, the annual frequency of EC and assembly meetings will be used in the regression analysis.

### 7.2.6 Average Relative Distribution and Discussion Hours in Per Meetings

The length of discussion significantly influences problem solving and decision-making (Andersson & Ostrom, 2008; Banjade, et al., 2006). Longer discussion time enables participants to produce their views in a meeting for consideration. The discussion time enables the process of debate on agenda items in the CFUG decision forum to occur, particularly in assembly meetings. The hypothesis is that the longer the discussion time the greater the average relative CF product distribution to poor and poorest households. Table 7.9 shows that the average relative distribution of firewood, fodder and timber to the poor and poorest is either not affected by discussion hours or is negatively affected. The results support

the conceptual model approach where representation of poor and poorest on the EC or through agenda items is most important, not the length of meetings.

Table 7.9 The average relative distribution of CF products and average discussion hours in EC meetings

| | | Average relative distribution per household | | | |
|---|---|---|---|---|---|
| Discussion hours per EC meeting | Number of CFUGs | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 0.5-1 | 7 | 1.15 | 0.95 | 1.00 | 0.89 |
| 2-3 | 18 | 1.16 | 0.99 | 0.98 | 0.88 |
| 3.1-4 | 5 | 1.22 | 1.02 | 0.91 | 0.85 |
| above 4 | 4 | 1.52 | 1.32 | 0.38 | 0.77 |
| | | | Fodder and grass | | |
| 0.5-1 | 7 | 1.15 | 0.72 | 1.11 | 1.02 |
| 2-3 | 18 | 1.32 | 0.86 | 1.03 | 0.79 |
| 3.1-4 | 5 | 1.61 | 1.00 | 0.74 | 0.77 |
| above 4 | 4 | 1.84 | 1.15 | 0.58 | 0.72 |
| | | | Leaf litter | | |
| 0.5-1 | 7 | 0.98 | 0.88 | 0.99 | 1.15 |
| 2-3 | 18 | 0.94 | 0.75 | 1.09 | 1.25 |
| 3.1-4 | 5 | 0.87 | 0.73 | 1.11 | 1.29 |
| above 4 | 4 | 0.85 | 0.69 | 1.15 | 1.31 |
| | | | Timber | | |
| 0.5-1 | 3 | 1.14 | 0.71 | 1.02 | 1.13 |
| 2-3 | 3 | 1.41 | 1.18 | 0.80 | 0.61 |
| 3.1-4 | 4 | 1.53 | 1.24 | 0.71 | 0.52 |
| above 4 | 4 | 1.81 | 1.29 | 0.51 | 0.40 |

The average relative distribution of CF products per wellbeing catogory by discussion time in assembly meetings is shown in Table 7.10. Again, the underlying assumption is that the poor and poorest households have the opportunity to raise their needs if there are more hours of discussion in assembly meetings. Unlike EC meetings, the average relative distribution of firewood, fodder leaf litter and timber to the poor and poorest households increased as the discussion time in assembly meeting increased.

Table 7.10 The average relative distribution of CF products per household and discussion hours per assembly meetings

| Discussion hours in assembly meetings | Number of CFUGs | Average relative distribution per household | | | |
|---|---|---|---|---|---|
| | | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 1-2 hours | 7 | 1.33 | 1.25 | 0.83 | 0.59 |
| >2.-3 hours | 11 | 1.11 | 1.09 | 0.95 | 0.85 |
| >3.-5 hours | 8 | 0.98 | 0.91 | 1.07 | 1.04 |
| >5-7 hours | 5 | 0.58 | 0.75 | 1.15 | 1.51 |
| | | | Fodder | | |
| 1-2 hours | 7 | 1.21 | 1.42 | 0.74 | 0.61 |
| >2.-3 hours | 11 | 1.13 | 1.32 | 0.80 | 0.76 |
| >3.-5 hours | 8 | 1.09 | 1.07 | 0.99 | 0.86 |
| >5-7 hours | 5 | 0.75 | 1.05 | 1.10 | 1.09 |
| | | | Leaf litter | | |
| 1-2 hours | 7 | 0.78 | 1.15 | 1.09 | 0.99 |
| >2.-3 hours | 11 | 0.64 | 1.11 | 1.03 | 1.22 |
| >3.-5 hours | 8 | 0.61 | 1.02 | 1.15 | 1.23 |
| >5-7 hours | 5 | 0.58 | 0.91 | 1.19 | 1.30 |
| | | | Timber | | |
| 1-2 hours | 3 | 2.15 | 1.52 | 0.31 | 0.02 |
| >2.-3 hours | 3 | 1.89 | 1.38 | 0.45 | 0.29 |
| >3.-5 hours | 4 | 1.38 | 0.72 | 1.21 | 0.70 |
| >5-7 hours | 4 | 1.28 | 0.60 | 1.29 | 0.81 |

The results show that additional discussion time in assembly meetings, where the poor and poorest can attend, has a positive effect on the average relative distribution, but in EC meetings, where representation is limited to EC members, there is no effect on average relative distribution to the poor and poorest. As a result of this analysis, the discussion time in assembly meetings could be used in the regression analysis.

### 7.2.7 Average Relative Distribution and EC or Assembly Meeting Involvement in the Operation Plan (OP)

The involvement of the EC or assembly meetings in the preparation of the OP is a possible factor explaining the distribution of CF products. The CFUG develops the OP, which includes activities such as forest protection, management strategies, production of CF products and distribution to the households. The involvement of the CFUG members in the preparation of the OP is in two ways: (a) involvement in EC meetings where only EC members participate in the preparation of the OP, and (b) involvement in assembly meetings where all CFUG members participate. The underlying assumption is that EC involvement in

the preparation of the OP is less accountable and, depending on the membership of the EC, may not favour poor households in the distribution of CF products, whereas assembly meeting involvement in the preparation of the OP is more likely to be favourable to the poor households because all households can participate (Kanel, 2006; Kanel, et al., 2005). Table 7.11 shows that the average relative distribution of CF products to poor and poorest households is higher when the assembly meeting was involved in the preparation of the OP rather than just the EC.

Table 7.11 The average relative distribution of CF products by involvement of EC or assembly meetings in the preparation of the OP

| | | Average relative distribution per household | | | |
|---|---|---|---|---|---|
| Involvement in preparation of OP | Number of CFUG | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| EC meetings | 16 | 2.11 | 1.25 | 0.41 | 0.24 |
| Assembly meeting | 15 | 0.71 | 0.48 | 1.51 | 1.31 |
| | | | Fodder and grass | | |
| EC meetings | 16 | 1.23 | 1.21 | 0.73 | 0.84 |
| Assembly meeting | 15 | 0.85 | 0.98 | 1.05 | 1.13 |
| | | | Leaf litter | | |
| EC meetings | 16 | 1.05 | 1.06 | 0.84 | 1.05 |
| Assembly meeting | 15 | 0.92 | 0.78 | 1.05 | 1.25 |
| | | | Timber | | |
| EC meetings | 6 | 1.33 | 1.21 | 0.68 | 0.78 |
| Assembly meeting | 8 | 0.85 | 0.72 | 1.05 | 1.38 |

This fact confirms the hypothesis that the greater representation of general users in assembly meetings where the OP was prepared would be more likely to favour the poor. In contrast, EC meetings are conducted by only EC members and, depending on the membership of the EC, this may not favour the poor. Kanel et al. (2005) suggested that the development of an appropriate mechanism is required to avoid the dominance of EC members in the preparation of the OP and in decision-making to make them accountable towards poorer households and general users. The result indicates that the involvement of an assembly meeting in the preparation of the OP of the CFUG is a better mechanism for the distribution of CF products to get more benefits to the poorer households. As a result of this analysis, the involvement of assembly meetings in the preparation of OP is to be used in the regression analysis.

### 7.2.8 Average Relative Distribution, the Share of EC Positions and Wellbeing Category

The average relative distribution of CF products by share of EC positions held by poor and poorest households is shown in Table 7.12. The share of EC positions is separated by wellbeing category and by caste. The average relative distribution of CF products to the poorer household increased when the proportion of EC positions held by these households increased.

Table 7.12 The average relative distribution by proportion of poor and poorest households on the EC

| | | Average relative distribution per household type | | | |
|---|---|---|---|---|---|
| Number of poor and poorest households on EC | Number of CFUGs | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| 0 | 2 | 1.54 | 1.29 | 0.59 | 0.58 |
| 1-10 | 8 | 1.18 | 1.19 | 0.88 | 0.75 |
| 11-20 | 9 | 1.08 | 1.08 | 0.97 | 0.87 |
| 21-30 | 10 | 0.67 | 0.78 | 1.21 | 1.34 |
| 31- 50 | 2 | 0.53 | 0.66 | 1.35 | 1.46 |
| | | | Fodder | | |
| 0 | 2 | 1.32 | 1.28 | 0.72 | 0.68 |
| 1-10 | 8 | 1.22 | 1.15 | 0.84 | 0.79 |
| 11-20 | 9 | 1.14 | 1.11 | 0.93 | 0.82 |
| 21-30 | 10 | 0.78 | 0.89 | 1.04 | 1.29 |
| 31- 50 | 2 | 0.54 | 0.57 | 1.47 | 1.42 |
| | | | Leaf litter | | |
| 0 | 2 | 1.34 | 1.28 | 0.71 | 0.67 |
| 1-10 | 8 | 1.11 | 1.14 | 0.87 | 0.88 |
| 11-20 | 9 | 0.89 | 1.11 | 0.99 | 1.01 |
| 21-30 | 10 | 0.88 | 0.88 | 1.07 | 1.17 |
| 31- 50 | 2 | 0.78 | 0.59 | 1.36 | 1.27 |
| | | | Timber | | |
| 0 | 1 | 1.51 | 1.48 | 0.52 | 0.49 |
| 1-10 | 2 | 1.35 | 1.29 | 0.68 | 0.68 |
| 11-20 | 3 | 0.99 | 0.85 | 1.05 | 1.11 |
| 21-30 | 7 | 0.64 | 0.81 | 1.28 | 1.27 |
| 31- 50 | 1 | 0.51 | 0.57 | 1.47 | 1.45 |

This finding supports the hypothesis that when poor households have the opportunity to hold an EC position they can influence the distribution of CF products in their favour. This result is reflected in organisational elite models presented as one of the components of the conceptual framework (Figure 3.1). Hence, from the results of this analysis, the share of poor and poorest households on the EC could be a variable for the econometric analysis.

### 7.2.9 Average Relative Distribution and the Share of EC positions held by Lower Caste

Table 7.13 shows the proportion of lower castes holding positions on the EC. It can be seen that the average relative distribution of firewood, fodder, timber and leaf litter to the lower caste (*Janjati* and *Dalit)* households increases as their representation on EC increases.

Table 7.13 The average relative distribution by share of disadvantaged caste on the EC

| | | Average relative distribution per caste household | | |
|---|---|---|---|---|
| Proportion of disadvantaged households on EC | Number of CFUGs | Elite | Dalit | Janjati |
| | | | Firewood | |
| 0 | 8 | 1.45 | 0.79 | 0.76 |
| 1-25 | 12 | 1.01 | 0.98 | 1.01 |
| 26-50 | 9 | 0.88 | 1.03 | 1.09 |
| 51- 75 | 2 | 0.66 | 1.20 | 1.14 |
| | | | Fodder | |
| 0 | 8 | 1.52 | 0.75 | 0.73 |
| 1-25 | 12 | 1.42 | 0.80 | 0.78 |
| 26-50 | 9 | 0.65 | 1.21 | 1.14 |
| 51- 75 | 2 | 0.41 | 1.28 | 1.31 |
| | | | Leaf litter | |
| 0 | 8 | 1.45 | 0.84 | 0.71 |
| 1-25 | 12 | 1.24 | 0.78 | 0.98 |
| 26-50 | 9 | 0.71 | 1.15 | 1.14 |
| 51- 75 | 2 | 0.62 | 1.21 | 1.17 |
| | | | Timber | |
| 0 | 3 | 1.42 | 0.75 | 0.83 |
| 1-25 | 3 | 1.11 | 0.99 | 0.90 |
| 26-50 | 4 | 0.78 | 1.11 | 1.11 |
| 51- 75 | 4 | 0.69 | 1.15 | 1.16 |

The finding shows that when the EC has more disadvantaged castes represented there are more benefits distributed to the disadvantaged. When the EC includes a large proportion of disadvantaged/lower castes this reflects the organisation elite model B in the conceptual framework (Figure 3.1). As a result of this analysis, the share of EC positions held by disadvantaged castes is a potential variable in the econometric analysis.

## 7.3 Conclusions from the Descriptive Statistics

The variables that affect the CFUG in the average relative distribution of CF products were analysed and considered for the econometric analysis. The results also addressed the question: does the greater participation of poor households mean they obtain greater benefit

from community forestry? The findings show that a number of factors increased the average relative distribution of timber, firewood, fodder and leaf litter increased to the poor and poorest households. The findings also supported the hypothesis that the organisational elite models, where the poor and disadvantaged households have a greater role in decision-making, are relevant to the way CFUGs operate. This supports the organisation elite A and B models. Increased participation means more effective voice for the poor and poorest.

The variables that appeared to affect the average relative distribution of CF products were frequency of assembly meetings, discussion time in EC and assembly meetings, involvement of assembly meetings in the preparation of the OP, the number of agenda items raised by poor and disadvantaged members for EC and assembly meetings, and proportion of disadvantaged households on EC. The forest attributes that affected average relative distribution to the poor included CF area per household, CF type and forest crown cover class. The education of the household head, age of the household head and household size (number of family members) were also included as variables but these variables have no significant impact on the distribution of CF products. Hence, these variables are excluded in descriptive analysis descriptive and the econometric analysis.

The explanatory variables for the regression are presented in Table 7.14. The dependent variable is relative distribution. Three regressions were done, one each for firewood, fodder, and timber. Leaf litter was not included for regression analysis because it is not a problem for poor and disadvantaged households. They can collect this product in free of cost from the CF. Moreover, there are no strict rules and regulations for the collection of leaf litter.

Table 7.14 Variables for the regression analysis

| Dependent Variables | Descriptions of variables |
|---|---|
| Relative amount of firewood | Average relative quantity of firewood collected by poor households |
| Relative amount of Timber | Average relative quantity of timber collected by poor households |
| Relative amount of fodder | Average relative quantity of fodder collected by poor households |
| **Independent Variable** | **Description of variables** |
| DISHREC | The average hours of discussion per EC meeting for collection of timber, firewood and fodder |
| DHRASS | The average hours of discussion in per assembly meeting for the collection of timber, firewood, and fodder |
| CONIFER | If forest type of CF Conifer 1, otherwise 0 |
| CNOVER70 | If more than 70 % forest crown cover 1, otherwise 0 |
| CFAREA | CF area per household (hectare) |
| NECMEET | Number of EC meetings per year |
| NASSMEET | Number of assembly meetings per year |
| PPPRHEC | If proportion of poor and poorest household on EC 1, otherwise 0 |
| PDSHEC | If proportion of disadvantaged household, on EC 1, otherwise 0 |
| PGNDISEC | Proportion of agenda items raised per EC meeting by disadvantaged (poor and lower caste) members |
| PGDISASS | Proportion of agenda items raised per assembly meeting by disadvantaged (poor and Lower Caste) members |
| ASSOP | If there is involvement of assembly meeting in preparation of OP 1, otherwise 0 |

## 7.4 Regression Results

The research problem was to identify the factors that determine the relative distribution of CF products to poor and disadvantaged households. The dependent variables are continuous. Under these conditions, Ordinary Least Squares (OLS) regression can be used for a dummy for the poor and poorest that is significant (Agresti, 1990; McFadden, 1981). The linear regression was done using on LIMDEP. For each CF product, explanatory variables were loaded in the first step of the linear regression analysis. The least significant explanatory variable was deleted in a step-by-step process until the model was stable as suggested by Agresti and Finlay (2009), Kleinbaum (1994) and Agresti (1990). Since variable deletion creates a nested model, model stability was examined by using the Chi-square test for significant difference of the t and F values.

### 7.4.1 Relative Distribution of Firewood

The final model for the relative distribution of firewood to poor and poorest household is shown in Table 7.15. The goodness of fit shows the relationships in the specified model are robust. The $R^2$ is 0.69 and the adjusted $R^2$ is 0.65. The diagnostic Log likelihood ratio = -232.6189, restricted (b=0) = -250.7535 and Chi-square (prob) =36.27 (.0000). These values indicate that the model explains a high proportion of the observed variance. The unrestricted model contained the variables in Table 7.15. The variables are significant in the stabilised (restricted) model as presented in Table 7.15. A multicollinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multicollinearity test in SPSS. As can be seen in matrix of Table 7.15, all the values are less than 3, confirming there was no multicolinearity.

Table 7.15 The regression results for the relative distribution of firewood per household

| Variable\| | Coefficient | Standard Error | t-ratio | P[\|T\|>t]\| |
|---|---|---|---|---|
| Constant | 3.5476** | 1.4614 | 2.4274 | .0214 |
| AREAHH | 2.6973*** | 1.6872 | 1.5984 | .0000 |
| CONIFER | -2.1327*** | 1.8586 | -1.1472 | .0001 |
| NASSMEET | 2.8478*** | 1.1836 | 2.4064 | .0004 |
| PPPRHEC | 2.7863*** | 1.9345 | 1.4403 | .0004 |
| ASSOP | 2.0458*** | 1.8866 | 1.0851 | .0005 |

Note: ***, **, * = Significance at 1%, 5%, 10% level.

$R^2$ =0.69 and Adjusted $R^2$ =0.65

Multicolinearity test matrix by SPSS

| | AREA HH | CONIFER | NASSMEET | PPPRHEC | ASSOP |
|---|---|---|---|---|---|
| AREA HH | | 1.021 | 1.128 | 1.061 | 1.182 |
| CONIFER | 1.261 | | 1.172 | 1.110 | 1.323 |
| NASSMEET | 1.261 | 1.172 | | 1.110 | 1.323 |
| PPPRHEC | 1.246 | 2.255 | 1.215 | | 1.327 |
| ASSOP | 1.209 | 1.199 | 1.208 | 1.062 | |

Area of CF per household (AREAHH) is positive and statistically significant at the 1% level. The greater per household area of CF, the greater the relative distribution of firewood from the CF. This result is similar to those of Adhikari and Di-Falco (2009) and Agrawal (2005) who found that the larger the area of CF, the higher was the quantity of firewood that could be extracted.

Conifer forest (CONIFER) is negative and statistically significant at the 1% level. Forests with conifer species produce less firewood. This result supports the hypothesised relationship

that conifer forest produces less firewood than mixed and broadleaf forest. This result is similar to that of Adhikari and Lovett (2006).

Number of assembly meetings (NASSMEET) is positive and statistically significant at the 1% level. The greater the number of assembly meetings the greater the relative distribution to the poor and poorest household of firewood extracted from the CF. This illustrated one of the major arguments advanced by mass movement theories that involving all user households frequently in a number of assembly meetings resulted in the better decisions that favour the extraction of more firewood than when there are fewer assemblies with lower representation of all users (A. Agrawal, 2001; Branney, Malla, Bhattrai, Tamrakar, & Neupane, 2001).

Proportion of poor and poorest households on the EC (PPPRTEC) is positive and statistically significant at the 1% level. The greater the proportion of poor and poorest households on the EC, the higher the relative distribution of firewood to the poor and poorest household. The poor and poorest households have no other assets such as landholdings and other sources of income. Therefore, the likelihood gaining a firewood benefit is higher when they appear more often in EC positions. This result is similar to the findings obtained by Lebel et al. (2008), Lebert and Rohde (2007), Jones (2007), Larson and Ribot (2007) and Lachapelle et al. (2004) who argued that the poor and poorest households could obtain higher benefit when they had the opportunity to be selected for decision-making positions.

Assembly meeting involvement in the preparation of the operation plan (ASSOP) is positive and statistically significant at the 1% level. The positive sign indicates that the greater the involvement of households in the preparation of OP in assembly meetings the greater the relative distribution of poor and poorest household of firewood collected from the CF. The higher household involvement in the preparation of the OP, the better the opportunity to develop an OP that could increase the amount of firewood available to the poor. This result is similar to that of Mansuri and Rao (2004) in their work on Community Based Driven Development (CBDD) for joint forest management in India Maharjan, Dhakal, Thapa, Schreckkenberg and Luitell (2009) found there was an improved benefit from CF in Nepal. They argued that the involvement of a large number of people in decision-making could favour general users, including the poor and lower castes, resulting in higher firewood extraction from CF.

### 7.4.2 Relative Distribution of Timber

The regression for the relative distribution of timber has an $R^2$ is 0.72 and adjusted $R^2$ of 0.69. The diagnostic Log likelihood ratio = -2.868510, the restricted (b=0) = 0-22.09813 and Chi-square (prob) = 38.46 (.0001). These values indicate that the model explains a high proportion of the observed variance. The significant variables in the stabilised (restricted) model are presented in Table 7.16. A multicollinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multicollinearity test in SPSS. As can be seen in matrix of Table 7.16, all the values are less than 3, confirming there was no multicolinearity

Table 7.16 Regression results of the factors determining the relative distribution of timber per household

| Variables | Coefficient | Standard Error | t-ratio | P[\|T\|>t]\| |
|---|---|---|---|---|
| Constant | -1.4273** | .5853 | -2.4342 | .0315 |
| AREAHH | 2.3495*** | .9495 | 2.4745 | .0004 |
| CONIFER | .9154*** | .3067 | 2.9839 | .0001 |
| FCOVER70 | 2.6356*** | .8345 | 3.1558 | .0001 |
| PDSHEC | -2.1345*** | .7315 | -2.9180 | .0021 |
| NASSMEET | .1908** | .0787 | 2.4232 | .0430 |

Note: ***, **, * = Significance at 1%, 5%, 10% level.

$R^2$ =0.72 and Adjusted $R^2$ =0.69

Multicolinearity test matrix of Table 7.16

| | AREAHH | CONIFER | FCOVER70 | PDSHEC | NASSMEET |
|---|---|---|---|---|---|
| AREAHH | | 1.117 | 1.239 | 1.100 | 1.131 |
| CONIFER | 1.127 | | 1.150 | 1.065 | 1.169 |
| FCOVER70 | 1.207 | 1.111 | | 1.052 | 1.091 |
| PDSHEC | 1.209 | 1.160 | 1.186 | | 1.193 |
| NASSMEET | 1.131 | 1.159 | 1.119 | 1.086 | |

Area of CF per household (AREAHH) is positive and statistically significant at the 1% level. As expected, the greater the area of the CF, the larger the relative distribution of timber extracted compared with small community forest holdings. Nilsson et al. (20011) found that 5.66 % higher yield per unit area in a large area compared with a small area when they applied four equal scenario treatments under Intensive Forest Management (IFM) in Sweden. Similarly, Cai and Zeng (2011) found that a large area of forest was one of the factors for farmer's willingness to obtain mortgage loans from the bank. They argued that if there is large area of forest it could provide large amount of yield and it makes easier for the farmers to pay mortgage loans after selling the large amount of forest products.

Conifer forest type (CONIFER) has a positive correlation with the relative distribution of timberto the poor and poorest household. This is positive and statistically significant at the 1% level. The larger the CF with conifer species, the higher amount of timber extracted. From field observations, it was seen that most forests are in good condition in the sample plots whereas broadleaf forests were of degraded forest cover with *Schima* and *Castonopsis* species that often provide lower amounts of timber. This indicates that conifer forest area increases the likelihood of the extraction of timber compared with conifer forest, particularly in the hill region of Nepal.

Forest crown cover class over 70% (FCOVER70) is positive and statistically significant at the 1% level. This indicates that the better the coverage of the forest, the more likely is that the CF is in good condition and provides higher timber yield. This result is similar to that of Gautam et al. (2004) who argued that as the crown cover class increased, the yield of timber decreased. The underlying assumption is that under good crown cover shrubs are lost and the forest converts into high forest that, in turn, yields more timber via natural succession.

Proportion of disadvantaged households on the EC (PDALTEC) is negatively correlated with the relative distribution of timber. This variable is negative and statistically significant at the 1% level. The greater the proportion of disadvantaged households as member of ECs, the lower amount of timber extracted from CF. The possible reason behind this could be that disadvantaged households do not own higher standard buildings and they require less timber than high caste and wealth status households. This result is similar to the findings of Adhikari and Di-Falco, (2009), Kanel and Dahal (2008), Thoms (2008), Agrawal et al. (A. Agrawal, et al., 2008), Larson and Ribot (2007), Hansen (2007), Jones (2007), A. Agrawal & Chhatre (2006), Iversen et al. (2006) and Adhikari el al. (2004) who argued that disadvantaged caste households used less timber than wealthy and caste elite with wealth status households.

Number of assembly meetings (NASSMEET) is positive and statistically significant at the 5% level. This indicates that the greater the number of assembly meetings, the greater the relative distribution timber to the poor and poorest household. The higher the number of assembly meetings the more time for discussion they have, which results in larger amounts of timber extracted from the forest. This result is similar to the result of A. Agrawal (2001) who argued that a higher number of assembly meetings provided maximum opportunity for users to discuss their timber requirements, which results in higher amounts of timber extracted from the forest.

### 7.4.3 Relative Distribution of Fodder

The following section explains the final model for the relative distribution of fodder to the poor and poorest household from the CF. The goodness of model fit for the result for average relative distribution of fodder as the dependent variable is robust. The $R^2$ is 0.68 and adjusted $R^2$ is 0.67. The diagnostic log likelihood ratio = -4.792821, restricted (b=0) = -24.147042 and Chi-square (prob) = 38.25 (.0001). These values indicate that the model explains a high proportion of the observed variance. The significant variables in the stabilised (restricted) model are presented in Table 7.17. A multicollinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multicollinearity test in SPSS. As can be seen in matrix of Table 7.17, all the values are less than 3, confirming there was no multicolinearity.

Table 7.17 The regression results of the factors determining the average relative distribution of fodder per household

| Variable | Coefficient | Standard Error | t-ratio | \|P[\|T\|>t]\| |
|---|---|---|---|---|
| Constant | 3.1349** | 2.1478 | 1.4595 | .0513 |
| PPPRHEC | -2.1785*** | 1.5638 | -1.3931 | .0020 |
| CONIFER | -2.8345 *** | 1.7345 | -1.6342 | .0043 |
| ASSOP | 2.5187*** | 1.3249 | 1.9009 | .0022 |

Note: ***, **, * = Significance at 1%, 5%, 10% level

$R^2$ =0.68 and Adjusted $R^2$ =0.67

Multicolinearity test matrix of Table 7.17

| | PPPRHEC | CONIFER | ASSOP |
|---|---|---|---|
| PPPRHEC | | 1.150 | 1.300 |
| CONIFER | 1.123 | | 1.310 |
| ASSOP | 1.059 | 1.159 | |

Proportion of poor and poorest households on EC (RPPPRTEC) is negative and statistically significant at the 1% level. The greater than proportion of the poor and poorest households on EC, the lower amount of fodder extracted from the CF. The poor and poorest households potentially have less livestock, which results in less fodder being needed. This result is similar to the findings obtained by Naidu (2009), Lebel et al. (2008) Jones (2007), Larson and Ribot (2007) and Chhetry (2004) who argued that poor households holding less livestock resulted in less fodder being taken from the CF. This is the consequence of poor households on the EC influencing the decision not in the favour of rich households obtaining larger amounts of

fodder. They could reflect on the condition of the forest and consider the sustainable use of fodder from the CF.

Conifer type of forest (CONIFER) has a negative correlation with the extraction of fodder from the CF. It is statistically significant at the 1% level. Conifer forest produces needles that are not suitable for fodder whereas broadleaf forest species provide palatable leafs and twigs that are very suitable for the collection and production of fodder from CF. This result is similar to those of Adhikari and Di-Falco (2009) and Adhikari et al. (2007) who found that broadleaf forest produced more palatable leaf and twigs as a very good fodder for cattle than conifer forests.

Assembly involvement in the operation plan (ASSOP) is positive and statistically significant at the 1% level. This indicates the greater the proportion of household involvement in the preparation of the OP, the greater the relative distribution of fodder to the poor and poorest household of fodder produced from the CF. More household involvement in the preparation of the OP, the better the development of the OP that increased the production of fodder. This result is similar to that Mansuri and Rao (2004) who worked on community forestry management and Community Based Driven Development (CBDD) in India. They argued that the involvement of larger numbers of people in decision-making provided more emphasis on improving forest conditions for fodder species by increasing household contributions for better management and extraction of trees for fodder.

## 7.5 Chapter Conclusions

The results of analysis, based on the elements of the conceptual model of elite in CFUGs, looking at the distribution of benefits from CF, were presented in this chapter. The variables used for descriptive analysis for the distribution of CF products were: area of CF per household, type of forest, crown cover class, agenda items raised by disadvantaged members in EC and assembly meetings, frequency of EC meetings, frequency of assembly meetings, average discussion hour in EC and assembly meetings, involvement of EC and assembly in preparation of the OP, relative proportion of poor and poorest households on EC and the relative proportion of *Dalit* households on EC. The variables were used for descriptive analysis and the analysis showed there was negative effect of firewood, fodder, leaf litter and timber distribution particularly to the poor and poorest households. Similarly, the result of average discussion hours in EC per meeting was also negatively linked for the distribution of CF products to poor and poorest household.

The determining factors used in the regression analysis for the relative distribution of firewood that were very positive and statistically significantly correlated were the forest area per household, frequency of assembly meeting, relative proportion of poor and poorest household on EC and assembly involvement in the preparation of the OP. In contrast, conifer forest type was negatively statistically correlated with the relative distribution of firewood.

The variables that were positive and statistically significant in the regression analysis used as determining factors for relative distribution amount of timber were forest area per household, crown cover class over 70%, conifer forest type and frequency of assembly meeting. However, the proportion of disadvantaged households on the EC was negative and statistically significant for the relative distribution of timber.

The involvement of assembly meetings in the preparation of the OP and relative distribution of fodder per household were positively correlated. In contrast, the proportion of poor and poorest households on the EC was significant and negatively correlated with the relative distribution of fodder. The reason behind this may be that more fodder is used by better-off households since they have greater needs of fodder due to having more units of private livestock and in assembly there could be higher proportion of poor and poorest household since they have less needs of fodder due to having less units of private ivestock.

The distribution of firewood, fodder, timber and leaf litter increased comparatively for the poor and poorest households when the proportion of poor and poorest households on the EC and relative proportion of the disadvantaged households on EC increased. Similarly, the relative distribution of CF products increased to the poor and poorest household with increased frequency of assembly meetings, if the assembly was involved in the preparation of the OP and discussion hours in assembly meeting increased. Both the findings of the descriptive and regression analyses indicated that the relative amounts of timber, firewood, fodder and leaf litter to poor and lower caste households could increase from CF where those households had the opportunity to raise their demands for forest products by participating in decision-making. These findings are reflected in organisation elite model of the conceptual models of elite in CFUGs (Figure 3.1) where the poor and poorest households' presence on the EC of the CFUG with a large proportion votes from one caste, the poor were able to dominate the EC to favour the poor and poorest households in distribution of benefits from CF.

The CFUG, will be established as an organisational elite model A and B where external agencies like NGOs and CBOs empower the poor and lower caste households to participate on the EC in a higher proportion. Moreover, a mechanism should be developed to allow poorer households to make their shares of benefits from CF, which could be by increasing the membership of poorer and low socioeconomic groups in decision-making specifically on the EC, which has greater accountability for policy implications. Thus, making these organisations more accountable and responsible towards poor and disadvantaged groups is the main existing challenge in the CFUGs.

When there is greater security by the representation of local poorer and disadvantaged lower caste households on the EC and they have an active role in decision-making, it has a very positive influence on making CF programmes successful. As poorer households depend more on forests for their basic forest products than rich and caste elite households embedded with wealth status, it will be possible to meet the objectives of distributing benefits in a more equitable and needs-based fashion by promoting good governance in the forestry sector in Nepal.

# Chapter 8
# DISTRIBUTION RULES

## 8.1 Introduction

The rules, regulations and practices relating to the extraction and distribution of CF products are analysed in this chapter. This chapter is done in the context of social and CFUG organisational structures and other factors that influence the distribution rules of CF. The organisational elite models A and B (Figure 3.1) reflect a situation where the poor have a greater ability to influence the outcomes of decision-making processes, and can influence the formulation and implementation of organisation rules, regulations and practices. In the context of this chapter, rules, regulations and practices are reflected in the distribution period (dependent variable). The main aim of this chapter is to answer the research question: when the poor are able to influence decisions, do the distribution rules for CF products favour the poor? The research hypothesis is that when the organisational elite models apply decisions regarding the formulation of rules, regulations and practices for the distribution of forest products will be more likely to provide benefits to the poor. In particular, it is believed that if the extraction and distribution period is longer, poor and marginalised households will benefit more because this eases the constraints on their labour force availability.

To answer the research question and hypothesis, the selection of open periods of CF for the extraction as the dependent variable was analysed in two phases. First, the descriptive characteristics of the data were used to determine the potential regression variables. Secondly, the results of the regression analysis are presented.

## 8.2 Descriptive Statistics

The results of the analysis of the data collected from the research site are presented in the form of summaries and tabulations with associated dependent variables. The dependent variables are the open periods for the harvesting, extraction and collection of timber, firewood, fodder and grass and leaf litter. The explanatory variables are wellbeing category, forest area per household, forest type, crown cover class and relative proportion of EC positions for poor and disadvantaged households.

### 8.2.1 Open Periods for Collecting CF Products

The open period is the dependent variable. The hypothesis is that low social status and poor households will benefit more if there is a longer open period for collecting CF products from the CF. (Springate-Baginski, et al., 2000) and (Spiteri & Nepal, 2008) found that low socioeconomic groups in Nepal are mostly engaged 12 months of the year in collecting products including firewood, fodder and grass, tubers, edible green leaves, fruits and berries, mushrooms and green leaves for food, dry leaves for use as fuel, bamboo, small timber, medicinal herbs, creepers for rope-making and seeds for making oil. This study concentrates the distribution period for the major forest products timber, firewood, fodder and grass and leaf litter.

The open periods for the extraction and collection of timber, firewood, fodder and grass and leaf litter from the survey are presented in Table 8.1. If there was no production and distribution, this is denoted by a blank. Open periods are separated into fewer than 7 days (A), 7 days to 1.5 months (B), more than 1.5 months to 3 months (C), more than 3 months to 6 months (D) and over 6 months (E). These were the categories used in the survey.

Table 8.1 The open periods for the extraction and collection of CF products

| Sn | CFUG name | Timber | Firewood | Fodder and grass | Leaf litter |
|---|---|---|---|---|---|
| 1 | Byaldhara Baglung 7 | A | A | A | C |
| 2 | Doyapragasti | | A | A | C |
| 3 | Bhimara Sigana | A | A | A | C |
| 4 | Chamere Tityang, 5 | A | A | A | D |
| 5 | Bhagawat ChisapaniTitang 1 | | A | A | D |
| 6 | Simal pata Titang 6,7,9 | B | B | B | D |
| 7 | Chhipchhipepale Baglung 11 | | B | B | D |
| 8 | Daha Bhakunde 6,7 | B | B | B | D |
| 9 | Jhangali Baglung 9 | B | B | B | D |
| 10 | Bancharedunga Baglung 9 | | B | B | D |
| 11 | Chutreni Baglung 11 | | B | B | D |
| 12 | Dhursheni Baglung 10 | | B | B | D |
| 13 | Dhoreni Baglung 10,11 | | C | C | D |
| 14 | Gobneri Painyopata 6 | | C | C | D |
| 15 | Kuledanda Bhakunde 8 | | C | C | E |
| 16 | Rani bhumi Sigana 1 2 3 | | C | C | E |
| 17 | Malukapatal Resh 1, 2 | C | C | C | E |
| 18 | SanghukholaRatopaharaResh 3,4 | C | C | C | E |
| 19 | Dhandh Malika 2,3 | C | C | D | E |
| 20 | Titaure Palakot 7-9 | C | E | D | E |
| 21 | Slyanipakha, Malika 1,3,4 | | E | D | E |
| 22 | Chyangrekharga Baglung 8 | | E | D | E |
| 23 | Mauribhid Malika 5 | | E | D | E |
| 24 | Sunakhari Malika 7,8,9 | | E | D | E |
| 25 | Ramrekha Baglung 1 | | E | D | E |
| 26 | Chitepani Baglung 9 | | E | E | E |
| 27 | ReshBuchhung salleri | | E | E | E |
| 28 | Chhaharedhara Baglung 4 | D | E | E | E |
| 29 | Dhadhkarka Bhakunde 9 | D | E | E | E |
| 30 | Shakhinichaur Paiyopata 2 | D | E | E | E |
| 31 | Jograni Painyopata 3 | D | E | E | E |

Note: Blank = no distribution, A<7days, B =7 days to 1.5 months, C= more than 1.5 months to 3 months, D= more than 3 months to 6 months and E= above 6 months

As can be seen in Table 8.1, the opening period selected by a CFUG was generally applied across all products, with leaf litter tending to be longer. First, five CFUGs opened their CF for fewer than 7 days for most products. The forests of these five CFUGs are generally more than 50% in juvenile stages. Therefore, they had less potential output. The rest of the CFUGs that had open periods for over 3 months and over 6 months generally have mixed forests that have a greater availability of most products. The open period of CFs for leaf litter was generally longer, over 3 months, and as leaf litter is a minor forest product for the open period and distribution was not considered a problem for rich and elite households. Therefore, the study of leaf litter is included in only the descriptive analysis and excluded from the regression analysis.

### 8.2.2 Relative Distribution of CF Products by Wellbeing Category and Open Period

The relative distribution of CF products by wellbeing category and open periods is presented in Table 8.2. The poor and poorest households collected a relatively higher amount of firewood, fodder and grass, leaf litter and timber when the open period of the CF increased. CFUGs do not usually have fixed open periods for the use of leaf litter, which does not have a market value except as thatching material for houses and bedding material for livestock. Most CFUGs in the surveyed area allowed free collection of grass and leaf litter.

Table 8.2 The relative distribution by wellbeing category and open period

| | | Relative Distribution per household | | | |
|---|---|---|---|---|---|
| Open period | Number of CFUGs | Rich | Medium | Poor | Poorest |
| | | | Firewood | | |
| <7 days | 5 | 1.26 | 1.25 | 0.78 | 0.71 |
| >7days to 1.5 months | 7 | 1.15 | 1.11 | 0.89 | 0.85 |
| >1.5 to 3 months | 7 | 1.05 | 0.95 | 0.98 | 1.02 |
| >3 to 6 months | | | | | |
| >6 months | 12 | 0.88 | 0.62 | 1.26 | 1.24 |
| | | | Fodder and grass | | |
| <7 days | 5 | 1.29 | 1.36 | 0.71 | 0.64 |
| >7days to 1.5 months | 7 | 1.15 | 1.12 | 0.78 | 0.95 |
| >1.5 to 3 months | 6 | 1.09 | 1.02 | 1.11 | 0.98 |
| >3 to 6 months | 7 | 0.85 | 0.88 | 1.15 | 1.12 |
| >6 months | 6 | 0.62 | 0.62 | 1.25 | 1.51 |
| | | | Timber | | |
| <7 days | 3 | 1.68 | 0.72 | 0.89 | 0.71 |
| >7days to 1.5 months | 3 | 1.22 | 0.55 | 1.12 | 1.11 |
| >1.5 to 3 months | 4 | 1.08 | 0.51 | 1.23 | 1.18 |
| >3 to 6 months | 4 | 0.69 | 0.46 | 1.44 | 1.41 |
| >6 months | | | | | |
| | | | Leaf litter | | |
| <7 days | 0 | 0 | 0 | 0 | 0 |
| >7days to 1.5 months | 0 | 0 | 0 | 0 | 0 |
| >1.5 to 3 months | 3 | 0.68 | 0.55 | 1.54 | 1.23 |
| >3 to 6 months | 11 | 0.54 | 0.54 | 1.51 | 1.41 |
| >6 months | 17 | 0.46 | 0.45 | 1.58 | 1.51 |

Note: Timber was distributed by only 14 CFUGs

It is concluded that poorer households obtain relatively more CF products when the collection period was increased. This confirms that it is important to understand the factors that determine the open period.

### 8.2.3 Open Periods and Forest Type

Forest type can be a factor in determining the open period. Common forest types in the study area include broadleaf, conifer, and mixed conifer and broadleaf. In broadleaf forest, grass growth is often very vigorous. In particular, katus-*Chilaune* and oak forests produce a higher amount of leaf litter than pine or other conifer forests. Broadleaf forests produce more and better quality firewood (e.g. oak) compared with conifers. Both broadleaf and conifer forests produce timber. However, better quality timber is produced by conifer forest in the hills of Nepal and India (Branney, et al., 2001; Shylajan & Mythili, 2003; Spiteri & Nepal, 2008). Given this, it might be expected that broadleaf and mixed forest would be open for longer periods for firewood. Table 8.3 shows that the number of open days for the distribution of firewood and fodder and grass is comparatively higher for CFUGs with broadleaf and mixed forests. For timber, conifer forest has a comparatively higher open period in a number of CFUGs. For leaf litter there is not an obvious difference in the open period between CFUGs.

Table 8.3 Forest type and open period (Number of CFUGs)

| | | Open periods for distribution of CF products | | | | |
|---|---|---|---|---|---|---|
| Forest type | Total number of CFUGs | <7 days | 7 days to 1.5 months | >1.5 to 3 months | > 3 to 6 months | > 6 months |
| | | | Firewood | | | |
| Conifer | 12 | 3 | 3 | 4 | 0 | 2 |
| Mix forest | 12 | 1 | 2 | 2 | 0 | 7 |
| Broadleaf | 7 | 1 | 2 | 1 | 0 | 3 |
| | | | Fodder and grass | | | |
| Conifer | 12 | 2 | 3 | 3 | 4 | 0 |
| Mix forest | 12 | 2 | 3 | 2 | 2 | 3 |
| Broadleaf | 7 | 1 | 1 | 2 | 1 | 2 |
| | | | Leaf litter | | | |
| Conifer | 12 | 0 | 0 | 0 | 6 | 6 |
| Mix forest | 12 | 0 | 0 | 0 | 4 | 8 |
| Broadleaf | 7 | 0 | 0 | 3 | 1 | 3 |
| | | | Timber | | | |
| Conifer | 8 | 3 | 2 | 3 | 0 | 0 |
| Mix forest | 4 | 0 | 1 | 1 | 2 | 0 |
| Broadleaf | 2 | 0 | 0 | 0 | 2 | 0 |

Note: Only 14 CFUGs distributed timber

### 8.2.4 Open Period and Forest Area (ha) per Household

The open period for extracting CF products is likely to be higher when there is a large forest area per household (Iversen, et al., 2006; Springate-Baginski & Blaikie, 2007). As can be

seen in Table 8.4, the open period for collecting firewood and fodder and grass increased as the area of CF per household increased. There is no clear link between open period for timber and leaf and forest area per household. For timber, this is likely due to the small amounts being produced and the fact that it is used for building rather than subsistence.

Table 8.4 Open period and forest area per household (ha) (Number of CFUGs)

| | | Open periods for distribution of CF products | | | | |
|---|---|---|---|---|---|---|
| Forest area per household (ha) | Total number of CFUGs | <7 days | 7 days to 1.5 months | >1.5 to 3 months | > 3 to 6 months | > 6 months |
| | | | | Firewood | | |
| 0.07 and less | 3 | 3 | 0 | 0 | 0 | 0 |
| 0.08-.013 | 4 | 0 | 3 | 1 | 0 | 0 |
| 0.14-0.18 | 5 | 0 | 1 | 4 | 0 | 0 |
| 0.19-0.32 | 7 | 2 | 3 | 2 | 0 | 0 |
| 0.33 and above | 12 | 0 | 0 | 0 | 0 | 12 |
| | | | | Fodder and grass | | |
| 0.07 and less | 3 | 3 | 0 | 0 | 0 | 0 |
| 0.08-.013 | 4 | 0 | 4 | 0 | 0 | 0 |
| 0.14-0.18 | 5 | 2 | 1 | 2 | 0 | 0 |
| 0.19-0.32 | 7 | 0 | 2 | 4 | 1 | 0 |
| 0.33 and above | 12 | 0 | 0 | 0 | 6 | 6 |
| | | | | Leaf litter | | |
| 0.07 and less | 3 | 0 | 0 | 3 | 0 | 0 |
| 0.08-.013 | 4 | 0 | 0 | 0 | 2 | 2 |
| 0.14-0.18 | 5 | 0 | 0 | 0 | 2 | 3 |
| 0.19-0.32 | 7 | 0 | 0 | 0 | 3 | 4 |
| 0.33 and above | 12 | 0 | 0 | 0 | 4 | 8 |
| | | | | Timber | | |
| 0.07 and less | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.08-.013 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.14-0.18 | 1 | 1 | 0 | 0 | 0 | 0 |
| 0.19-0.32 | 4 | 2 | 1 | 1 | 0 | 0 |
| 0.33 and above | 9 | 0 | 2 | 3 | 4 | 0 |

Note: Only 14 CFUGs distributed timber

The results support the hypothesis that larger areas of CF per household increase open periods although just for the collection of firewood and fodder but not for timber. The finding of Nagendra and Gokhale (2008) support these results. Hence, the area of CF per household could be a determining factor for open periods in the regression model.

### 8.2.5 Forest Crown Cover Class of CF and Open Period

Table 8.5 shows that, as the percentage of crown cover increased, the length of the open period also increased. This is not surprising since the crown cover is correlated with forest quality and the ability of the forest to produce outputs. Hence, crown cover could also be one of the attributes for determining the number of open days in the regression analysis

Table 8.5 Open periods and Forest Crown Cover Class (Number of CFUGs)

| Forest Crown Cover | Number of CFUGs | CF open periods for distribution of CF products | | | | |
|---|---|---|---|---|---|---|
| | | <7 days | 7 days to 1.5 months | >1.5 to 3 months | > 3 to 6 months | > 6 months |
| | | | | Firewood | | |
| 30-50 % | 4 | 1 | 3 | 0 | 0 | 0 |
| 51-70 % | 11 | 0 | 0 | 4 | 0 | 7 |
| 71 and over | 16 | 4 | 4 | 3 | 0 | 5 |
| | | | | Fodder and grass | | |
| 30-50 % | 4 | 2 | 2 | 0 | 0 | 0 |
| 51-70 % | 11 | 3 | 3 | 2 | 3 | 0 |
| 71 and over | 16 | 0 | 2 | 4 | 4 | 6 |
| | | | | Leaf litter | | |
| 30-50 % | 4 | 0 | 0 | 3 | 0 | 1 |
| 51-70 % | 11 | 0 | 0 | 0 | 4 | 7 |
| 71 and over | 16 | 0 | 0 | 0 | 7 | 9 |
| | | | | Timber | | |
| 30-50 % | 3 | 3 | 0 | 0 | 0 | 0 |
| 51-70 % | 5 | 0 | 3 | 1 | 1 | 0 |
| 71 and over | 6 | 0 | 0 | 3 | 3 | 0 |

Note: Only 14 CFUGs distributed timber

### 8.2.6 Open period and the Proportion of EC Positions by Poor and Poorest

Table 8.6 shows the relationship between the relative share of EC positions held by the poor and poorest and open periods. The hypothesis is that the higher the relative share of EC positions held by the poor and poorest households, the longer the open periods. The results show that, as the share of EC positions held by the poor and poorest households increased, the open period tended to increase. This indicates that when poor and poorest households access EC positions they able to influence decisions for a longer open period. This result is similar to the finding of R. Pokharel (2009) and Gauli and Hauser (2011) who argued that when poor and low socioeconomic households get the opportunity to make decisions, they will increase the open periods of CF. Hence, the relative share of EC positions held by poor

and poorest households could be one of the determining factors for the number of open days in the regression analysis.

Table 8.6 Open period and proportion of EC positions hold by the poor and poorest (Number of CFUGs)

| | | Open period for distribution of CF products | | | | |
|---|---|---|---|---|---|---|
| Percentage of poor and Poorest households on EC | Total number of CFUGs | <7 days | 7 days to 1.5 months | >1.5 to 3 months | > 3 to 6 months | > 6 months |
| | | | | Firewood | | |
| 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| 1-10 | 8 | 1 | 1 | 1 | 0 | 5 |
| 11-20 | 9 | 2 | 1 | 2 | 0 | 4 |
| 21-30 | 10 | 1 | 3 | 4 | 0 | 2 |
| 31-50 | 2 | 0 | 1 | 0 | 0 | 1 |
| | | | | Fodder and grass | | |
| 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| 1-10 | 8 | 1 | 1 | 1 | 3 | 2 |
| 11-20 | 9 | 2 | 1 | 2 | 1 | 3 |
| 21-30 | 10 | 1 | 3 | 2 | 3 | 1 |
| 31-50 | 2 | 0 | 1 | 1 | 0 | 0 |
| | | | | Leaf litter | | |
| 0 | 2 | 0 | 0 | 0 | 2 | 0 |
| 1-10 | 8 | 0 | 0 | 0 | 5 | 3 |
| 11-20 | 9 | 0 | 0 | 1 | 2 | 6 |
| 21-30 | 10 | 0 | 0 | 1 | 2 | 7 |
| 31-50 | 2 | 0 | 0 | 1 | 0 | 1 |
| | | | | Timber | | |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1-10 | 3 | 0 | 1 | 1 | 1 | 0 |
| 11-20 | 3 | 1 | 0 | 1 | 1 | 0 |
| 21-30 | 6 | 1 | 1 | 2 | 2 | 0 |
| 31-50 | 1 | 0 | 1 | 0 | 0 | 0 |

Note: Only 14 CFUGs distributed timber

### 8.2.7 Conclusions from the Descriptive Analysis

The economic and social structure related variables that appeared to be related to the open periods in the various descriptive analyses were selected for econometric analysis. The area and open period of the forest, the crown cover class and open period, and forest type by open period were also analysed and it seemed that crown cover class, area of CF and type of forest also influenced the distribution period of CF products. Lastly, the proportion of EC positions hold by poor and poorest households appeared to increase the open period. The EC position link to open period is reflected in the organisational elite model where poor households'

representation on the EC influenced EC decisions regarding open period. Independent variables used in the regression analysis are shown in Table 8.7

Table 8.7 Variables used in the econometric analysis

| Dependent Variables | Descriptions of variables |
|---|---|
| Firewood | Open period for firewood collection (0 is open 0 to 1.5 months, 1 is 1.5 to 3 months, 2 is 3 to 6 months and 3 is more than 6 months) |
| Timber | Open period for timber collection (0 is open 0 to 1.5 months, 1 is 1.5 to 3 months, 2 is 3 to 6 months and 3 is more than 6 months) |
| Fodder | Open period for fodder collection (0 is open 0 to 1.5 months, 1 is 1.5 to 3 months, 2 is 3 to 6 months and 3 is more than 6 months) |
| **Independent Variables** | |
| CONIFER | If forest type conifer, otherwise 0 |
| PRCROWN | Proportion of crown cover class by number of CFUGs |
| FAREAHH | Community forestry area per household in hectares |
| PRDISEC | Proportion of disadvantaged households on EC |
| RPPPRTEC | Proportion of poor and poorest households on EC |

## 8.3 Regression Findings

Regression analysis was conducted to examine the research problem of identifying the factors that determine the length of the open period. The dependent variable is the open period, which could assume only four discrete values 0, 1, 2, or 3 for timber, firewood and fodder distribution, respectively. It means when the open period was 0 to 1.5 months is 0, more than 1.5 months to 3 months 1, more than 3 months to 6 months 2 and more than 6 months denoted 3 of discrete choice. Under this condition, the discrete choice ordered probability regression model (ordered logistic model) is the best model to analyse the problem (Agresti & Finlay, 2009; McFadden, 1974, 1981). The LIMDEP econometric programme was used to analyse the model (Greene, 2000; Scott & Freese, 2006; Wart, 1996). Multicollinearity among the explanatory variables was tested before running the model. As discussed earlier, there are three major products: (a) timber (b) firewood (c) fodder and grass. For each dependent variable, the explanatory variables were loaded into the discrete choice ordered probability regression model. As explained by Agresti and Finlay (2009) and Maddala (Maddala, 1983), with a linear term, the least explanatory variables were deleted in a step by step process until the model was stable. Thus, the variable deletion creates a stable (restricted) model.

**(a) Factors determining the open periods for timber extraction**

The result for the open period for timber is shown in Table 8.8. The $R^2$ is 0.21. The $R^2$ for the discrete choice model at the upper bound is 0.22 (R. Shrestha & Alavalapati, 2006). Hence, the $R^2$ value of 0.21 suggests that the discrete choice ordered model has reasonable explanatory power. The Likelihood Ratio test shows that regression model explains a high percentage of the observed variance. A multicollinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multicollinearity test in SPSS. As can be seen in matrix of Table 8.8, all the values are less than 3, confirming there was no multicolinearity.

Table 8.8 Ordered logistic regression results showing determination of open period for timber distribution for 14 CFUGs

| TIMBER | Coefficient | Standard Error | Z | Prob z>\|Z\| |
|---|---|---|---|---|
| Variables | Index Function for Probability | | | |
| Constant | 0.0843*** | 0.0294 | 2.87 | 0.0041 |
| AREAHH | 0.0765** | 0.1860 | 0.41 | 0.0307 |
| PRPPSTEC | 6.2335*** | 3.1674 | 1.97 | 0.0091 |
| CONIFER | 1.1293** | 0.5258 | 2.15 | 0.0317 |
| PRCROWN | -2.9605*** | 1.1110 | -2.66 | 0.0077 |
| | Threshold parameter for Index | | | |
| Mu (1) | 1.1814*** | 0.3811 | 3.1 | 0.009 |

Note: ***, **, * ==> Significance at 1%, 5%, 10% level.

Multicolinearity test matrix of Table 8.8

| | AREAHH | PRPPSTEC | CONIFER | PRCROWN |
|---|---|---|---|---|
| AREAHH | | 1.063 | 1.001 | 1.062 |
| PRPPSTEC | 1.074 | | 1.061 | 1.013 |
| CONIFER | 1.012 | 1.062 | | 1.074 |
| PRCROWN | 1.061 | 1.001 | 1.060 | |

McFadden Pseudo R-squared =0.213.The Chi-square value is 12.07778. Log likelihood = -22.28966, the restricted Log likelihood -28.32855 and p< 0.0001).The explanatory variables of the model have the expected signs. The area of CF per household (AREAHH) is positive and significant at the 5% level. The greater per household area of CF, the longer the open period for timber.

The proportion of EC positions held by the poor and poorest households (RSPPRTEC) is positive and significant at the 1% level. As the proportion of poor and poorest households on the EC increases, the open period for timber increased. This indicates that when the poor and

poorest households have the opportunity to make decisions as EC members, they are able to increase the open period.

Conifer forest type (CONIFER) is positive and statistically significant at the 5% level. With conifer forest, the open period for extraction of timber is longer. By field observation, it was seen that most broadleaf forests are degraded with *Castenopsis* species and *Schima wallichii* with other associated species and do not produce better quality timber used for construction. This result is similar to those of K. K. Shrestha & McManus (2007), A. Agrawal and Chhatre (2006), Uprety (2006) and Adhikari (2005) who found that conifer forests were opened for longer periods than broadleaf. They argued that in hills of Nepal there are degraded broadleaf forests with *Castonopsis* spp. and *Schima wallichii*, which are less suitable for timber, particularly for building construction and furniture, compared with good quality of the hills area's conifers and hence have shorter open periods than conifer forest.

The proportion of crown cover class (PRCROWN) is negative and statistically significant at the 1% level. As the proportion of crown cover class closed asbeing more mature forest that would require less time to harvest the desired timber (fewer trees need to be cut, or easier to find). It is the expected result because crown cover class is a function of the volume production of timber wood and when the degree of canopy closure increases individual trees has to struggle for higher trunk (stem) growth and length because of higher completion for light (IUFRO, 1997; Nilsson, Fahlvik, Johansson, Lundström, & Rosvall, 2011).

**(b) Factors determining the open period for firewood extraction**

Table 8.9 shows the relationships for the open period for firewood extraction in a Discrete Choice ordered (Ordered Logistic model) regression. The McFadden Pseudo $R^2$ is 0.49. As the Log likelihood function is =-12.71474 and restricted Log likelihood function is -23.80177. The F-statistic value for the log likelihood ratio test for firewood extraction = p<.00113. Chi-square Prob = 22.17406. The explanatory variables of the ordered model have expected signs. A multicollinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multicollinearity test in SPSS. As can be seen in matrix of Table 8.9, all the values are less than 3, confirming there was no multicolinearity.

Table 8.9 Ordered logistic regression results showing determination of open period for firewood distribution for 31 CFUGs in Nepal

| FIREWOOD | Coefficient | Standard Error | Z | Prob z>\|Z\| |
|---|---|---|---|---|
| Variables | Index Function for Probability | | | |
| Constant | -4.9807** | 3.4372 | -1.45 | .0167 |
| AREAHH | 6.8463** | 3.2610 | 2.09 | .0392 |
| PRPPSTEC | 2.8641** | 1.2264 | 2.33 | .0209 |
| CONIFER | 6.1988** | 3.1590 | 1.96 | .0497 |
| PRCROWN | 3.4907*** | 1.7983 | 2.09 | .0066 |
| PRDISEC | 2.8639** | 1.2264 | 2.30 | .0216 |
| | | | Threshold parameter for Index | |
| Mu (1) | 2.1284*** | .4714 | 4.51 | 0.0000 |
| Mu(2) | 3.0093*** | .4451 | 6.76 | 0.0000 |
| Mu(3) | 4.5792*** | .8599 | 5.32 | 0.0000 |

Note: ***, **, * ==> Significance at 1%, 5%, 10% level.

Multicolinearity test matrix of Table 8.9

| | AREAHH | PRPPSTEC | CONIFER | PRCROWN | PRDISEC |
|---|---|---|---|---|---|
| AREAHH | | 1.012 | 1.013 | 1.061 | 1.074 |
| PRPPSTEC | 1.029 | | 1.035 | 1.065 | 1.032 |
| CONIFER | 1.004 | 1.091 | | 1.076 | 1.063 |
| PRCROWN | 1.038 | 1.071 | 1.051 | | 1.013 |
| PRDISEC | 1.043 | 1.081 | 1.038 | 1.005 | |

The area of CF per household (AREAHH) is positive and statistically significant at the 5% level. As the area of the CF increases, the open period for firewood increases. This result is similar to those of B. Agrawal (2009) and Iversen et al. (2006) who found that CFUGs with a larger area of CF per household had longer open periods for extracting firewood from the CF.

The proportion of EC positions held by poor and poorest households (RPPPSTEC) is positive and statistically significant at the 5% level. As the proportion of poor and poorest households on the EC increases, the open period for firewood collection increases. Again, the poor and poorest households have small private landholdings and depend on CF for firewood. That, in turn, leads to a longer open period when they are able to influence EC decisions.

Conifer forest type (CONIFER) is positive and statistically significant at the 5% level. With conifer forest, the open periods for extraction of firewood were longer. The proportion of forest crown cover (PRCROWN) is positive and statistically significant at the 1% level. As forest crown cover increases, the open period for firewood extraction increases. This result is similar to that of Gautam et al. (2004) who analysed the relationship between forest crown cover class and distribution period. They argued that if there is a higher percentage of crown

cover, there is a richer of stock of trees, saplings and shrubs, which provide a greater yield to the CF users that, in turn, results in longer open periods of CF for collecting firewood.

The proportion of disadvantaged (lower caste) households on the EC (PRDISEC) is positive and statistically significant at the 5% level. As the proportion of the disadvantaged households increased the open period for firewood collection increased. As with the poor, it is likely based on the fact that disadvantaged (lower caste) households have limited amount of land holdings. It means, they are unable to collect firewood from their own land. They depend solely on CF for the collection of firewood. Hence, if they have the opportunity on the EC as decision-makers, they increase the open period of the CF.

**(c) Factors determining the opening period for fodder and grass**

The variables significant in the restricted (stable) model are shown in Table 8.10. These numbers indicate that the model explains a high percentage of the observed variance. Multi-Collinearity test was also conducted to find out whether there was any collinearity problem with the explanatory variables. This was done using the multi-collinearity test in SPSS. As can be seen in matrix of Table 8.10, all the values are less than 3, confirming there was no multicolinearity

Table 8.10 Regression results of the factors that determine open periods for collecting fodder and grass in 31 CFUGs in Nepal

| FODDER | Coefficient | Standard Error | Z | Prob z>\|Z\| |
|---|---|---|---|---|
| Variables | Index Function for Probability | | | |
| Constant | -1.7182** | .8290 | -2.07 | .0382 |
| CONIFER | .8521* | .4501 | -1.89 | .3609 |
| AREAHH | 2.9564*** | .8824 | 3.35 | .0008 |
| PRDISEC | 2.2086*** | .7756 | 2.85 | .0044 |
| | Threshold Parameter for Index | | | |
| Mu (1) | 2.3099*** | .3241 | 7.13 | .0000 |
| Mu(2) | 2.4729*** | .3297 | 7.50 | .0000 |
| Mu(3) | 4.0733*** | .8605 | 4.73 | .0000 |

Note: ***, **, * ==> Significance at 1%, 5%, 10% level.

Multicolinearity test matrix of Table 8.10

| | CONIFER | AREAHH | PRDISEC |
|---|---|---|---|
| CONIFER | | 1.004 | 1.034 |
| AREAHH | 1.013 | | 1.000 |
| PRDISEC | 1.060 | 1.061 | |

Table 8.10 shows that the McFadden Pseudo $R^2$ is 0.39 for the open period of CF for extracting fodder and grass. The model significance level is p<.00022. The Log likelihood function is -25.5224 and restricted Log Likelihood function is -35.2603 with a Chi- Square 19.4758.

The area of CF per household (AREAHH) is positive and statistically significant at the 1% level. As the area per household of the CF increases, the open period for fodder and grass increases. This result is similar to those of B. Agrawal (2009) and Iversen et al. (2006) who found that CFUGs with a larger area per household of CF were open for longer periods for extracting fodder and grass.

The proportion of disadvantaged household (PRDISEC) is positive and statistically significant at the 1% level. As the proportion of disadvantaged households on the EC increases, the open period for fodder and grass increases. The logic is that disadvantaged households do not have large enough private land endowments and are heavily dependent on CF for fodder and grass. Hence, when they have an opportunity to express their needs on the EC, they can influence the decision to be favourable for them.

Conifer forest (CONIFER) is negative and statistically significant at the 5% level. With a conifer forest, there was a shorter open period of the CF for collecting fodder and grass. The fodder obtained from a conifer forest is not palatable for livestock and this is likely to be linked to the shorter period. This result is similar to the results of G. Joshi and Negi (2011) (2011) and Adhikari (2005) who found that conifer forests do not provide livestock food in terms of tree leaf fodder. On the other hand, G. Joshi and Negi (2011), A. Agrawal and Chhatre (2006) and Adhikari (2005) found that broadleaf forest is very useful since it provides better quality palatable fodder for ruminants.

## 8.4 Chapter Conclusions

This chapter examined the factors determining the open period for CF product distribution. The descriptive analysis showed that this is an important factor for the poor since the relative amount they receive increased as the open period increased.

The results from the regression equations show that the factors that are important for the open period for the distribution of timber and firewood are forest type, CF area per household, crown cover class and proportion of poor and poorest households on the EC. In addition, the open period for firewood distribution was linked to the proportion of poor and poorest households on the EC and the proportion of disadvantaged households on the EC. For the open period for only fodder and grass distribution, the area of CF per household and forest type was important. In general it seems that as the relative participation of poor and disadvantaged household increases on the EC, the distribution period is likely to favour those households.

The findings of both the descriptive and regression analyses support the conceptual model (Figure 3.1) where the EC was structured on the basis of organisational elite model. The higher proportion of the poor and poorest households on the EC favoured a longer open period.Thus, the findings answer the research question: Does the structure of the EC affect the formulation of rules in a way that impacts on CF benefit distribution to the poor and disadvantaged? The results show that when the poor and disadvantaged households can influence decisions for the formulation of rules, regulations and practices through the EC positions, the rules were favourable to them. It means that leadership experience provided by external agencies to enable election to the EC and discussion by the poor brings fundamental changes in the CFUGs and the effects on the poor.

Finally, the policy implications are that the thinking, behaviour and approaches of policy makers need to change to place more emphasis on enabling the poor and lower caste segments of Nepalese society to be involved in EC positions that have an influence in developing the rules, regulations and practices that, in turn, benefit them.

# Chapter 9

# SUMMARY AND CONCLUSIONS

## 9.1 Introduction

The purpose of this study was to examine the opportunities for the poor and disadvantaged in leadership and the effect this has on distribution of CF products and rules governing distribution from CF. The study focused on three research questions: (1) Are there factors that facilitate the poor and disadvantaged being represented on the EC?; (2) Does the composition of the EC affect in distribution of benefits of CF to the poor and disadvantaged members?; and, (3) Does the composition of the EC affect the distribution rules of CF products in a way that impacts on benefits, particularly for the poor and disadvantaged?

Studies have shown that the CF programme has been successful in increasing forest stocks, including conservation and regeneration. However, it has not been as successful in the distribution of benefits and alleviating poverty as was expected. Some scholars suggested that central government policies might have constrained the use of forests under CF in a way that limits the pool of benefits. The principles underpinning CFUGs mean that power is intended to be shared among all groups. However, it is believed that, in practice, the poor have been largely left out of decision-making. Forest policy does not dictate how forest users should organise in terms of sharing power. This is left to circumstance. In addition, it is not well understood how social structures, including the organisation of forest user groups, affects CF benefit distribution to poor households. This study attempted to examine how the social and organisational structure of CFUGs affects benefit sharing from CFs. The findings of the study in answer to the research questions are summarised in this chapter. Both the theoretical and policy implications of the study are explained, as well as some recommendations for further studies.

## 9.2 Conceptual Model

The literature review showed that, among the elite models, the consensually integrated, plural elite and organisational elite models had the potential to explain the formation of decision-making structures and benefit distribution of CF. Specifically, the models explain decision-making power in different organisational and social structures. These models provided the basis for developing a conceptual model of elite behaviour in CFUGs (Figure 3.1 reproduced here).

Figure 3.1 Conceptual Model

| | | Community Caste Structure | |
|---|---|---|---|
| | | One caste | Many castes |
| Wealth Status of EC Members | Rich Only | Consensually integrated elite model | Plural elite model |
| | Rich and Poor | Organisational elite model A | Organisational elite model B |

The main features of the conceptual model are: (i) in a community where the EC has only one caste and is dominated by the rich, it functions as the consensually integrated elite model; (ii) in a community with many castes where the EC is dominated by the rich, it functions as the as plural elite model; (iii) in a community with one caste where EC members include both rich and poor households, it functions like the organisational elite model A; and (iv) in a community with many castes where the EC includes a mix of rich and poor households, it functions like the organisational elite model B. The key feature of the conceptual model is that it provides a mechanism for the poor and disadvantaged to be in power in a CFUG, and thereby influences decisions about CF benefit distribution. Based on the conceptual model, an empirical model was developed to test the following hypotheses:

1. There are factors not related to the wealth or caste that increase the likelihood of being on the EC.
2. When the EC has more disadvantaged groups represented there are more benefits distributed from CF, and more benefits to the poor.
3. When the EC has more disadvantaged groups represented, decision rules are more favourable to the poor.

The empirical model was outlined in Figure 4.1 and is reproduced below. The leadership attributes deals with hypothesis 1, the distribution amount deals with hypothesis 2, and the rules of distribution deals with hypothesis 3. The link between leadership attributes and benefits from CF is in the EC structure. If the EC structure is the Organisational elite model A or B this reflects a structure that has representation by poor and disadvantaged households. This in turn provides opportunity for the amount produce for CF and rules for distribution to be influenced by poor and disadvantaged in a way that benefits them.

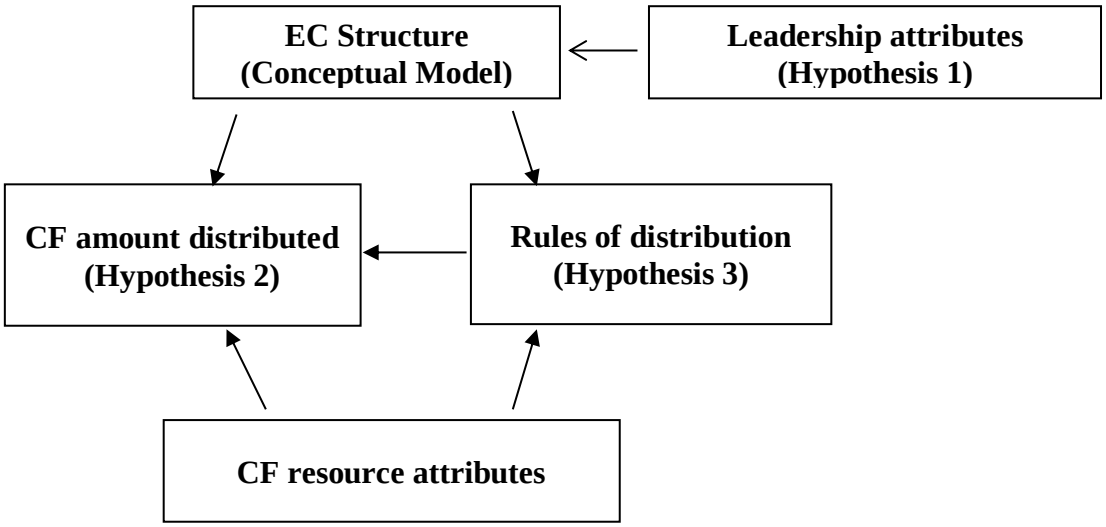


Figure 4.1 The empirical framework for modelling community forest decisions in Nepal

## 9.3 Leadership Opportunities for Poor and Disadvantaged Households

EC members are the main leaders in decision-making for forest management and benefit distribution in CFUGs. Therefore, it is important to understand what attributes are important for selection as a leader. This was tested in a regression. The results show the following key conclusions:

- The likelihood of being a leader (executive committee member) of the CFUG is negatively correlated with attributes of the poor and poorest households.
- The likelihood of being a member of the EC is higher for the households who are NGO members.

These findings suggest that when the poor and disadvantaged have access to the leadership skills and training in NGOs they have the potential to be become CFUG leaders. This means hypothesis 1 is true. The assumption is that NGOs build up ability and strengthen the leadership capabilities of poorer people or encourage/empower someone to be a leader through training, workshops and study tours. This means there is a potential pathway for the poor and disadvantaged households to become members of the EC through opportunities linked with NGOs. This also means that the organisational elite models outlined in the conceptual framework can explain decision-making in CFUGs and form a way for poor and disadvantaged households to become part of the elite in decision-making.

## 9.4 Effect of EC Membership on Relative Distribution of CF Products

The analysis in Chapter 7 suggests that the greater the proportion of poor and disadvantaged households on the EC, the more frequently assembly meetings are held, and the greater the involvement of assembly meetings in the preparation of operation plans, the larger the relative distribution of CF products to poor and disadvantaged households. The reason for larger the distribution to poor and disadvantaged households is believed to be that these factors result in a greater input of the poor and disadvantaged households into the decision-making. The findings support the hypothesis that when the poor and disadvantaged have the opportunity for input in decision-making about CF product distribution they obtain greater benefit from CFs. These findings again reflect the positive effect of the organisational elite model on decisions that affect the poor.

## 9.5 Effect of EC Membership on Distribution Rules

There are a number of conclusions from the analysis of distribution rules of the CF products (Chapter 8). The effect of EC membership on distribution rules depends on the products being considered. The open period for firewood and timber distribution was linked to the proportion poorer and disadvantaged households on the EC. In addition, area per household, forest type and proportion of crown cover were also important and correlated with the open period for firewood and timber. In general, as the proportion of poor and disadvantaged households increased on the EC, the distribution period is likely to longer and favoured those households. The forest area per household was positively and conifer forest type negatively correlated with the open period. The findings support the hypothesis that representation of the poor and disadvantaged groups on the EC allows them to influence the distribution period that, in turn, increases the benefits they receive from CF. Again, the findings support the positive effect of the organisational elite model on outcomes for the poor and disadvantaged segments of Nepalese society.

## 9.6 Policy Implications

Based on the above findings, this study draws some policy implications and makes recommendations for policy makers. The study raised important concerns regarding community-level decision-making for the management of community forestry. The main concerns are how to involve poor and low socioeconomic groups in decision-making. As the study results have shown, when this happens community forestry turns into a stepping stone to alleviate poverty and to achieve MDGs. Some of the policy implications are as follows:

An interesting result of this study is that the involvement of NGOs is a determinant of a household's ability to participate in the EC and so influence decisions. Therefore, it is essential to create opportunities for NGOs to provide training and education to poor households.

The main policy implications relate to actions that will eventually change the composition of the EC so that the poor and disadvantaged households have an opportunity to participate in decision-making. In this way, CF will help to alleviate poverty and to achieve the millennium goal of poverty reduction.

### 9.6.1 Contribution to knowledge

This study makes a number of contributions to the literature on community forestry:

- First, the study has extended the literature on models of elite behaviour to a community-based context in a developing country. By extending the concept of the organisational elite model, the study has been able to capture the decision-making behaviour of the EC where the traditional elite share power with the poor and lower caste households. By becoming empowered through an EC position, the poor and disadvantaged are able to obtain a greater share of benefits from community forests. As predicted by the consensually integrated and plural elite models, when the rich hold most of the key positions on the EC, they capture most of the benefits. The model of elite developed in this research has the potential to be extended to other examples of community-based resource management in the developing world.
- Secondly, the study shows that while leadership opportunities for the poor and disadvantaged are constrained by socially constructed factors that favour the elite. If they are able to link with an NGO/CBO, there is a greater chance of access to decision-making positions in the CFUG because NGO/CBO experience develops their leadership capacity. This shows the important role that NGOs can play in community development, apart from the particular focus of the NGO, through the organisational and leadership skills they create.
- Thirdly, the study has shown that the intended outcomes of the participatory approach inherent in the structure of CFUG assembly meetings can be successful when they operate under the right conditions.

## 9.7 Recommendations for Future Research and Work

Some recommendations for future research are as follows:

- First, this study is based on data from only one district. Some of the social problems associated with exclusions could be different in different districts. In addition, organisational factors can change with time. Therefore, this type of study needs to be done in many districts and should be repeated from time to time to update our understanding of the effect of social factors.
- Second, due to time and resource constraints, this study sampled only 10 households in each CFUG. A more complete study that sampled all households in a number of CFUGs would provide a more complete picture of what was happening in CFUGs.

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# Appendix A

## Household survey

1. What is the name and address of your CFUG?

_____

2. Could you please provide me your livestock holding and required food (fodder, lawn grass and Corn in kg) in last 12 months?

| Category of livestock | | Number | Fodder needed for livestock | | Lawn grass needed for livestock | | Amount of corn used For livestock in NRs | |
|---|---|---|---|---|---|---|---|---|
| | | | From own land | From CF | From own land | from CF | From own land | Purchased from Market |
| Buffalo | M | | | | | | | |
| | K | | | | | | | |
| Cows | | | | | | | | |
| Goats | | | | | | | | |
| Horse | | | | | | | | |
| Sheep | | | | | | | | |
| Pigs | | | | | | | | |
| Gross total | | | | | | | | |

Note: 1 Bhari = 40 kg, M=Male, K =Kalf

3. Who should set the agenda for the following in an EC meeting?

| Activities | Only CP | only ECM | Any CFUG member |
|---|---|---|---|
| Firewood distribution | ☐ | ☐ | ☐ |
| Fodder distribution | ☐ | ☐ | ☐ |
| Timber distribution | ☐ | ☐ | ☐ |
| CF income distribution | ☐ | ☐ | ☐ |
| CF land allocation | ☐ | ☐ | ☐ |
| Appointed of EC members | ☐ | ☐ | ☐ |

Note: CP =Chairperson, ECM =Executive Committee Member

4. Who should decide to get agenda setting for the following in User assembly meeting?

| Activities | Only CP | Only EC M | ANY CFUG member |
|---|---|---|---|
| Firewood distribution | ☐ | ☐ | ☐ |
| Fodder distribution | ☐ | ☐ | ☐ |
| Timber Distribution | ☐ | ☐ | ☐ |
| CF income distribution | ☐ | ☐ | ☐ |
| CF land allocation | ☐ | ☐ | ☐ |
| Appointed of EC members | ☐ | ☐ | ☐ |

5. Do the poor, women and lower caste always be involved in setting of agenda in EC and Assembly meeting of CFUG?

Yes ☐ No ☐ if yes proceed Q no. 6 other wise Q no 7

6. How many business items of agenda set by poor, women and lower caste in an EC and assembly meeting in the last 12 months?

| | EC MEETING | | | | ASSEMBLY MEETING | | | |
|---|---|---|---|---|---|---|---|---|
| ACTIVITIE | TOTAL BUSINESS ITEMS | POOR | WOMEN | LOWER CASTE | TOTAL BUSINES S ITEMS | POOR | WOMEN | LOWER CASTE |
| Firewood distribution | | | | | | | | |
| Fodder distribution | | | | | | | | |
| Timber Distribution | | | | | | | | |
| CF income distribution | | | | | | | | |
| CF land allocation | | | | | | | | |
| Appointed of EC members | | | | | | | | |
| Others (please specify) ----- | | | | | | | | |

7. What is the best process to come on decision? (Please tick one only)

| | |
|---|---|
| BY SIMPLE MAJORITY | ☐ |
| By 2/3 majority | ☐ |
| By unanimous | ☐ |

8. Which is the best procedure for Voting? (Please tick only one)

| Type of Decision for | Voting system | | type if majority | | |
|---|---|---|---|---|---|
| | Show of hand | Secured Ballot | simple majority | 2/3majority | Unanimous |
| Selection of EC member | ☐ | ☐ | ☐ | ☐ | ☐ |
| Firewood | ☐ | ☐ | ☐ | ☐ | ☐ |
| Fodder | ☐ | ☐ | ☐ | ☐ | ☐ |
| Timber | ☐ | ☐ | ☐ | ☐ | ☐ |
| NTFPs | ☐ | ☐ | ☐ | ☐ | ☐ |
| Allocation of CF products and CF fund for poor | ☐ | ☐ | ☐ | ☐ | ☐ |
| Programme, Budget and expenditure | ☐ | ☐ | ☐ | ☐ | ☐ |

9. Which members of the CFUG Executive would most likely to take consideration the needs of poor and marginalised group of CFUG? (Please circle only one number for each EC member)

| | MOST LIKELY | | | | UNLIKELY |
|---|---|---|---|---|---|
| Elected | 1 | 2 | 3 | 4 | 5 |
| Appointed | 1 | 2 | 3 | 4 | 5 |
| Higher Caste | 1 | 2 | 3 | 4 | 5 |
| Lower caste | 1 | 2 | 3 | 4 | 5 |
| Rich | 1 | 2 | 3 | 4 | 5 |
| Poor | 1 | 2 | 3 | 4 | 5 |
| Women | 1 | 2 | 3 | 4 | 5 |
| Member included in non-CFUG politics | 1 | 2 | 3 | 4 | 5 |

10. What pecent your firewood requirement do you obtain from the CF? (Please tick only one of the following)

Less than 25 % ☐

25 to 50 % ☐

50 to 75% ☐

75% and over ☐

11. Are there problems for the collecting firewood from the CF? (Please tick as apply)

| | |
|---|---|
| None | ☐ |
| Lack of fair collection rule | ☐ |
| Available in OP but not distributed | ☐ |
| Insufficient of firewood | ☐ |

12. How much Forest products did you get from CF in the last 12 months?

| Products | Amount | Unit |
|---|---|---|
| Fire wood | | |
| Fodder | | |
| Timber | | |
| Lawn Grass | | |
| NTFPs | | |
| Others (please specify) -------- | | |

13. What is and what should be in the priority for products in OP? (Please rank on priority with 1 as first 2 as second and so on)

| Products | What is | What should be |
|---|---|---|
| Firewood | | |
| Timber | | |
| Fodder | | |
| Lawn grass | | |
| NTFPs | | |
| Others(Please specify)------ | | |

14. Do you have any experience of leadership with the CFUG or another organisation?

| Designation | In CFUG | | | | In another organisation | | | |
|---|---|---|---|---|---|---|---|---|
| | Present | Years | Past | Years | Present | Years | Past | Years |
| Chair person | ☐ | | ☐ | | ☐ | | ☐ | |
| Executive member | ☐ | | ☐ | | ☐ | | ☐ | |
| Advisory member | ☐ | | ☐ | | ☐ | | ☐ | |

15. Which religion and caste do you belong from?

| Religion | Tick | Caste (Parbatiyas) | Tick | Caste (Terrain) | Tick |
|---|---|---|---|---|---|
| Hindu | ☐ | Brahmin | ☐ | Forward | ☐ |
| Buddhist | ☐ | Chhetry | ☐ | Backward | ☐ |
| Muslim | ☐ | Thakuri | ☐ | Schedules | ☐ |
| Christian | ☐ | Newar | ☐ | Others (Please specify) | ☐ |
| Sikh | ☐ | Rai | ☐ | | |
| Others | ☐ | Limbu | ☐ | | |
| | | Magar | ☐ | | |
| | | Gurung | ☐ | | |
| | | Schedules | ☐ | | |
| | | Other (please specify) | ☐ | | |

16. What is your mother tongue?

| Parbatiyas | Tick | Terrain | Tick |
|---|---|---|---|
| Nepali | ☐ | Maithili | ☐ |
| Newar | ☐ | Bhojpuri | ☐ |
| Rai | ☐ | Abadhi | ☐ |
| Limbu | ☐ | Tharu. If Tharu please specify (Maithili, Bhojpuri and Abadhi) | ☐ |
| Gurung | ☐ | Others (Please specify) ---------- | ☐ |
| Magar | ☐ | | |
| Schedules | ☐ | | |
| Other (please specify) | ☐ | | |

17. What is your age group? (Note for household head or respondent)

| | | | |
|---|---|---|---|
| 18-25 ☐ | 26-35 ☐ | 36-45 ☐ | 46-55 ☐ |
| 56-65 ☐ | 66-75 ☐ | 76 -85 ☐ | 86 and over ☐ |

18. What is your gender Male ☐ Female ☐

19. What is your marital status?

| Single/never married | Married | Divorced/Separated | Widowed | De facto relationship |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

20. What is the highest level education you have attended?

| | | | |
|---|---|---|---|
| No formal education | ☐ | Primary education | ☐ |
| Middle school education | ☐ | High school education | ☐ |
| Intermediate | ☐ | Diploma Degree | ☐ |
| Mater Degree | ☐ | Other(please specify) _____ | ☐ |

21. How much land do you cultivate? (Please tick only one of row)

| Holding of land size | Unit | Landless | 0.1-0.5 | 0.6-1.0 | 1.1-2.0 | 2.1-4.0 | 4.1 -6.0 | 61.- 8.0 | 8.1- 10.0 | Over10.1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Own land | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Rented land | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Rented out | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Sharing of Crops | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

22. What is your occupation?

| | | | | | |
|---|---|---|---|---|---|
| Farmer | ☐ | Teacher | ☐ | Public Service | ☐ |
| Social service | ☐ | Political leader | ☐ | Other (please specify)- | ☐ |

23. What is your total annual income in NRs and numbers of family members? Tick only one in each row

| Sources of income | 0-19, | 20-49 | 50-100, | 101-150 | 151-200 | 201-300 | 301-500 | 501 and Over | Total mem |
|---|---|---|---|---|---|---|---|---|---|
| Ag+horticulture | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| Livestock | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| Business | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| Job | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| Other (please specify) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |

24. Do you have any comment and particular issue that should be raised to increase the voice of poor in decision-making?

Thanks

# Appendix B

## Survey for Executive Committee of the CFUGs

1. General information

Name and address of CFUG: _____
Total number of households in the group: _____
Number of rich household _____
Number of medium household _____
Number of poor household _____
Area of forest (ha) _____

Forest type by %age of crown covers
Conifer _____
Mature or harvesting size_____
Pole size _____
Below pole size including seedling_____
Broadleaf _____
Mature or harvesting size_____
Pole size _____
Below pole size including seedling_____
Mixed _____
Mature or harvesting size_____
Pole size _____
Below pole size including seedling_____

Date Forest handed over (d/m/y) / / /

Date(s) forest operation plan revised (d/m/y):

(a) / / / (c) / / /
(b) / / / (d) / / /

Distance to motor-able road (Km): _____
Altitude range (meter): _____

2. How do CFUG executive members be structured of EC?
Total members in EC _____
Number of elected member _____
Number of appointed member _____
Number of advisory member _____
Number of other member _____

3. How many number of executive committee members represent from the following group?
Higher Caste (BCTN) and (BRKDH) _____
Lower caste _____
Rich members of CFUG _____
Poor members of CFUG _____
Poorest members of the poor _____
Local leader non-CFUG politics _____
Women member _____
Other (please specify) _____

4. Who was involved in preparing the existing Operation Plan? Tick as apply

| | |
|---|---|
| EC Prepared with DFO input, assembly discussed/approved and DFO approved | □ |
| Assembly prepared with DFO input and DFO approved | □ |
| EC prepared with input from DFO and DFO approved | □ |

5. What is the production and income of this CF in last 12 months?

| Categories of products or income | Unit | Internal use in CFUG | Sale of products outside of CFUG | Income from Sale (NRs) | |
|---|---|---|---|---|---|
| | | | | internal | Outside |
| Timber | | | | | |
| Firewood | | | | | |
| fodder | | | | | |
| NTFPs | | | | | |
| Levy | | | | | |
| Penalties | | | | | |
| Donations | | | | | |
| Other income | | | | | |
| Total | | | | | |

6. In the last 12 months how many agenda item were set by the following for Executive Committee meeting and assembly of CFUG?

| | E C meeting | Assembly meeting |
|---|---|---|
| Chair person | | |
| EC including chairperson | | |
| NonEC CFUG member | | |
| Advisory member | | |
| Poor, women and lower caste | | |
| DFO | | |
| District Council | | |
| Non DFO Govt Agencies | | |
| NGO | | |
| Other (please specify) ---------- | | |

Note: EC= Executive committee

7. In average how long does it take for the decision of the following business in EC meetings and user assembly in last 12 months?

| business Item | EC meeting | | | | | User Assembly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Time in hours | | | | | | | | | |
| | 1-2 | 2-4 | 4-6 | 6-12 | <12 | 2-3 | 3-4 | 4-8 | 8-12 | <12 |
| Timber distribution | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| Firewood distribution | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| Fodder distribution | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| NTFPs collection | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| Distribution of CF income | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| Buying furnishing materials and stationary | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |

8. In last 12 months how long is the CF opened for the collection of timber, firewood, fodder and NTFPs for users?

| Periods | Firewood | Fodder | Timber | NTFPs |
|---|---|---|---|---|
| Less than one month | □ | □ | □ | □ |
| 2 months to less than 3 months | □ | □ | □ | □ |
| 3 months to less than 6 months | □ | □ | □ | □ |
| 9 month to 12 months | □ | □ | □ | □ |

9. How is firewood allocated from your CF? Please tick one

| On equal basis | | On need basis | | Others (please specify) |
|---|---|---|---|---|
| per household | Per person | Per household | per person | ----- |
| □ | □ | □ | □ | □ |

10. What has happened to the availability of firewood in this CF since the formation of the CFUG? (Please tick only one)

| | |
|---|---|
| Increased | □ |
| Decreased | □ |
| Same | □ |
| Not sure | □ |

11. Do you have provision in your OP to distribute firewood for making charcoal?
Yes □ No □ if yes proceed 12 otherwise 13

12. What is the provision in your OP for charging firewood for making charcoal? (Please tick only one)

| | |
|---|---|
| Free of cost | □ |
| Reduced rate from firewood cost | □ |
| Same rate as firewood | □ |
| Other (please specify)---------- | □ |

13. Do you have any special rule for Distribution of fire wood by poor and marginalised groups in your CFUG?

Yes □ No □

14. If yes are the rules for distribution of firewood in practices?

| | |
|---|---|
| Provision in OP | □ |
| Provision in Op but practiced differently | □ |
| Decision by assembly | □ |
| Decision by EC | □ |
| Decision by Chairperson of EC | □ |

15. What proportion of total CFUG demand is met by CF?

| Demand and supply situation | Firewood | Fodder | Timber | NTFPs |
|---|---|---|---|---|
| less than 25 % | □ | □ | □ | □ |
| 26 to 50% | □ | □ | □ | □ |
| 51 to 75% | □ | □ | □ | □ |
| 76 % or more | □ | □ | □ | □ |

16. How much land is allocated to poor households from your CF?

| Purpose for allocation | Implemented activities | Allocated land (ha) | No of Benefited households |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

17. How much money was distributed to the targeted services for poor households from your CFUG fund in last 12 months?

| Purpose of distribution | Distributed money (NRs) | Implemented activities | No of Benefited households |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

18. When do you open your CF to grazing?

| Periods | |
|---|---|
| Never | □ |
| Less than one month | □ |
| 2 months to less than 3 months | □ |
| 3 months to less than 6 months | □ |
| 6 months to less than 9 months | □ |
| 9 month to 12 months | □ |

19 What is the annual grazing levy?

| Category of Livestock | Rate in NRs | |
|---|---|---|
| | Other households | Poor Households |
| Buffalo | | |
| Cows | | |
| Goats | | |
| Sheep | | |
| Horse | | |
| Pigs | | |
| Others | | |

20. What sorts of changes have there been for poor households in last five years?

| | Income | Access to education | Access to health | Access to drinking water | Access to road | Others(specify) ---------- |
|---|---|---|---|---|---|---|
| More | □ | □ | □ | □ | □ | □ |
| Same | □ | □ | □ | □ | □ | □ |
| Less | □ | □ | □ | □ | □ | □ |

21. How is wealth ranking done in your CFUG? (Please tick only one)

| | |
|---|---|
| CFUG members make categories themselves | □ |
| DFO office helps to categorise | □ |
| An outside agency helps to categorise | □ |
| Other (please specify) ---------- | □ |

22. How is CFUG demand determined? (Please tick only one)

| | |
|---|---|
| EC decide after consulting each household | □ |
| EC decide after a hamlet meeting of households | □ |
| EC determines demand without Consulting of any household | □ |
| Determined by an assembly | □ |
| Determined by DFO alone | □ |
| Demand not determined | □ |

23. What should be in the priority for production in your CF? (Number in rank of priority with as first 1, 2 as 2nd and so on)

| | |
|---|---|
| Timber | |
| Fire wood | |
| Fodder | |
| NTFPs | |
| Other Income Generation activities except NTFPs | |

24. Do you have any provision in OP to change the forest composition (species) according to choice of users? (Please tick one)

| | |
|---|---|
| None | □ |
| Change OP by EC decision alone | □ |
| Change OP by User assembly decision alone | □ |
| Change OP by DFO without consulting any one | □ |
| Change OP by DFO on request of CFUG assembly | □ |

25. If you have community members who are not included as members of CFUG why is that case? (Please tick as many as apply)

| | |
|---|---|
| They are not interested | □ |
| Interested but cannot afford to pay levy or fees of CFUG | □ |
| Executive committee members are not agree to give them membership | □ |
| Live to far away | □ |
| Other cause (please specify) ---------- | □ |

26. Do you have any comment and particular issue that should be raised to increase the voice of poor in decision-making?

Thanks

# Appendix C

## Ethnic caste representation of Chairperson of CFUGs

| Name of CFUG | Address | Ethnic caste of Chair person | Maximum Education of Chairperson | Occupation |
|---|---|---|---|---|
| 1. Doya Pragati | Malika 1 | Elite | Literate | Farmer |
| 2 Dadhah | Malika 2,3 | Elite | Literate | Farmer |
| 3 Saghu khola | Resh 3,4 | Elite | IA passed | Student |
| 4 Malukapatal | Resh 1,2 | Janjati | Literate | Farmer |
| 5 Rani bhumi | Sigana 1,2,3 | Janjati | Literate | Farmer |
| 6.Kuledanda | Bhakunde 8 | Janjati | Literate | Ex-Army (India) |
| 7.Gobnery | Paiyu Patta 6 | Elite | Literate | Farmer |
| 8.Dhoreni | Baglung Municipality 10,11 | Elite | S.L.C. | Govt service |
| 9. Dhurseni | Baglung Municipality 10, | Elite | IA | Govt service |
| 10. Chutreni | Baglung Municipality 11 | Elite | Literate | Farmer |
| 11.Bancharedhunga | Baglung Municipality 9 | Janjati | Literate | Farmer |
| 12 Jhangali | Baglung Municipality 9 | Elite | Illiterate | Farmer |
| 13. Chittepani | Baglung Municipality 9 | Elite | Illiterate | Farmer |
| 14. Chyangre Kharka | Baglung Municipality 8 | Elite | 9 class passed | Farmer |
| 15.Chhaharedhara Kailam | Baglung Municipality 4 | Janjati | IA | Trader |
| 16. Ramrekha | Baglung Municipality 1 | Elite | Literate | Farmer |
| 17. Daha | Bhakunde 6,7 | **Janjati** | Literate | Ex-Army |
| 18.Chhipchhipepani | Baglung Municipality | Elite | SLC | Farmer |
| 19 Bayaldhara | Baglung Municipality 7 | Janjati | IA | Farmer |
| 20`. Titaure | Palakot 7,8 | Elite | SLC | Govt service |
| 21. Sallenipakho | Malika 1 | Elite | Literate | Farmer |
| 22. Mauribhir | Malika 5 | Elite | SLC | Teacher |
| 23.Sunakhari | Malika 7,8,9 | Elite | IA | Teacher |
| 24. Jograni | Painyo pata 8,9 | Elite | BA | Teacher |
| 25. Resh Buchung Salleri | Resh 3 | Elite | BA | Govt service |
| 26.Bhimarakopakho | Sigana 4,5 | Elite | Literate | Farmer |
| 27. Sakhenichaur | Painyo pata 1,2 | Elite | Literate | Farmer |
| 28. Dhadkharka | Bhakunde 9 | Elite | Literate | Ex-Army |
| 29. Chamero | Titang 5 | **Dalit** | Literate | Farmer |
| 30.Bhagwati Chisa pani | Titang 1 | Elite | Literate | Ex-Army |
| 31. Simal pata | Titang 6,7,9 | Elite | Literate | Ex-Army |

Note: In occupation one of these: Government service, Farmers, Teacher, Traders/Businessman, Hotel owner, student, NGO service holders, Affiliated to non CFUG Politics and others.